Advant® OCS
with Master software

Upgrading the MasterPiece® 200/1

User's Guide

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Chapter 1 Introduction

1.1 General Information

The purpose of this document is to describe how to upgrade an existing MasterPiece 200/1 to an Advant Controller 450 or only with parts from the Advant Controller 450.

It is assumed that the reader has good knowledge of both the MasterPiece 200/1 and the Advant Controller 450.

As there are numerous ways in which the existing MasterPiece 200/1 may be configured, the intention is not to describe a solution for each and every one of them, but rather to give guidelines and examples giving some good ideas. The hardware changes are therefore presented with a “what-to-do”- approach, that is the principles are presented, but the exact way in which mechanics, cables etc. are to be physically arranged is left out for the reader to decide with respect to the situation at hand.

The way to transfer the software from the MasterPiece 200/1 to the Advant Controller 450 does on the other hand not differ in between different configurations of the MasterPiece 200/1. This has made it possible to describe the software handling with a “how-to-do”-approach.

For extensive information about how to configure and handle the Advant Controller 450 please refer to the Advant Controller 450 documentation.

NOTE

In this manual references to documentation of Advant Controller 450 are given for Advant Controller 450, version 1.0. If the intention is to use another version of the Advant Controller 450, please refer to the corresponding manuals valid for that version.

1.2 Naming of an Upgraded MasterPiece 200/1

When a MasterPiece 200/1 has been upgraded with for example a CPU subrack from the Advant Controller 450, the upgraded system are not automatically allowed to be called an Advant Controller 450.

To call the upgraded system for Advant Controller 450 then **all** items in the system (like modules, units, power supplies etc.) must be in accordance with the Version Specification for the Advant Controller 450 and its I/O system. Further information about revision index for modules and units is found in a subdocument to Version Specification called *Module Revision Index, Advant Controller 450*.

If this condition is not fulfilled, then the system is as an **Upgraded MasterPiece 200/1**.

1.3 Terminology

Term	**Explanation**
Subrack	The mechanics which house a row of modules.
CPU subrack (MP)	Subrack which houses the CPU in MasterPiece 200/1. This subrack can also contain a number of S100 I/O modules
CPU subrack (AC)	Subrack which houses the CPU in Advant Controller 450. This subrack cannot contain any S100 I/O modules
I/O subrack	Subrack which houses S100 I/O modules but no CPU.
Submodule carrier	Module housing submodules (SC510, SC520 and SC530).
Submodule	Modules located on submodule carriers.

1.4 Advant Controller 450 Outline

The Advant Controller 450 is the bigger brother in the Advant Controller 400 Series family.

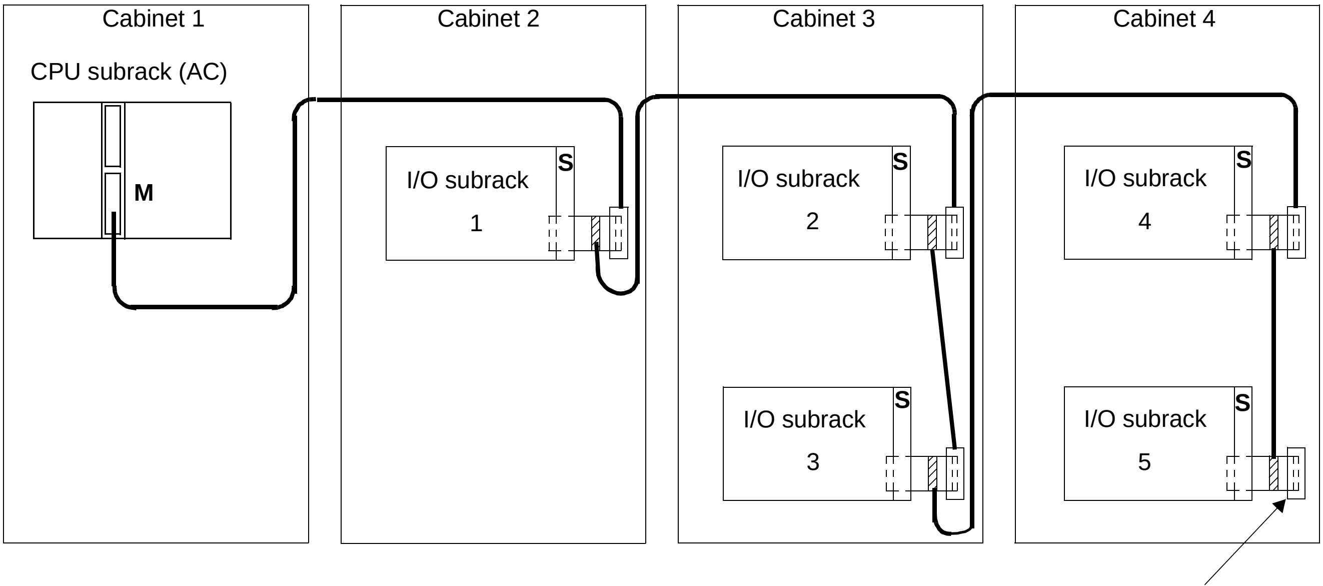
The controller is modular with modules mounted in 19” subracks. The subracks are placed in cabinets.

Advant Controller 450 and its S100 I/O system consists of:

- One CPU subrack (AC)
- Up to five I/O subracks with a maximum length of the electrical I/O bus extension cable of 12 meters. The subracks are of same type as for MasterPiece 200/1.

NOTE

The S100 I/O system, by definition, is not a part of the Advant Controller 450.



DSTC 176
Termination unit

M indicates master module CI540
Connection on module front

S indicates slave module DSBC 173A
Connection from behind

Figure 1-1. Example of S100 I/O Electrical Bus Extension

1.5 Advant Controller 450 CPU Subrack Mechanics

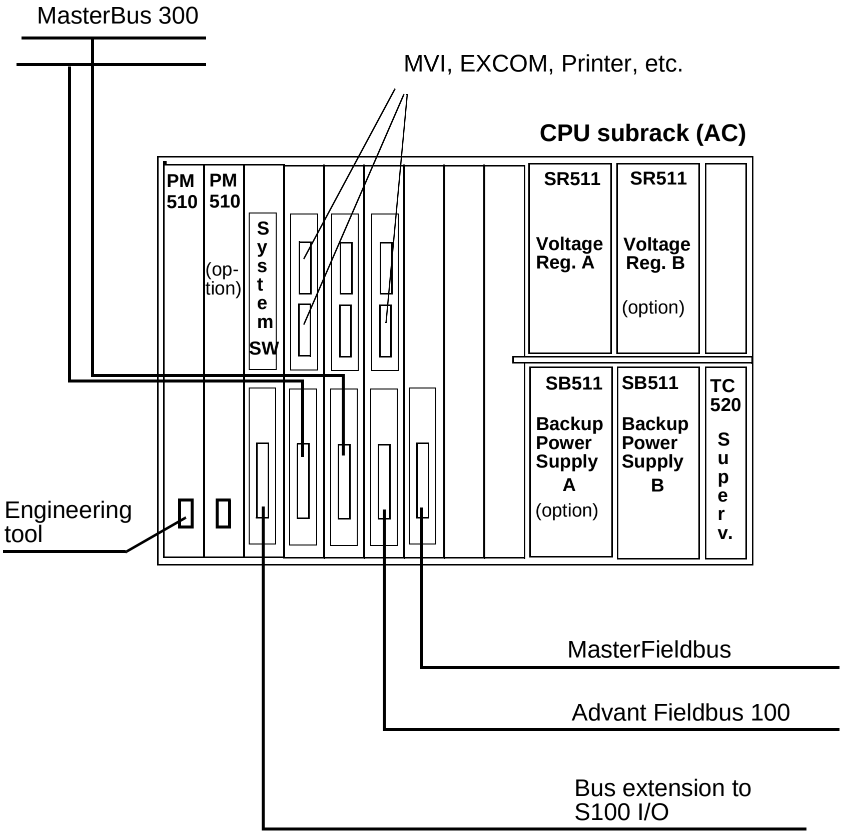


Figure 1-2. Example of CPU Subrack (AC) in Advant Controller 450

As seen above the CPU subrack (AC) is different compared to the CPU subrack (MP) and cannot house S100 I/O modules.

If the CPU subrack (AC) is compared to the CPU subrack (MP) the following differences can be noticed:

- The subrack has a different height, 435 mm (12 SU), including fan
- The subrack is designed for mounting on the rear wall of the cabinet, but not in hinged frames
- S100 I/O modules cannot be placed in the CPU subrack (AC)
- Communication boards from MasterPiece 200/1 cannot be used. Submodules on carriers must be used.
- No special version of CPU subrack (AC) is needed for redundant CPUs.
- The system software is available on a Program Card (PCMCIA type 2), not on PROM boards

For complete information about features in Advant Controller 450, please refer to the *Advant Controller 450 documentation*.

1.6 Which Systems can be Upgraded

Different kinds of MasterPiece 200/1 can be upgraded.

The earlier MasterPiece 2X0 can be upgraded if differences between MasterPiece 2X0 and MasterPiece 200/1 version 2.1 also are eliminated. This upgrade is not described in this document.

There are several situations when the upgrading can cause problems.

- **If MasterBus 200 is used**
  As MasterBus 200 is not supported in Advant Controller 450 the network must be upgraded to MasterBus 300.
- **If Programmable interface board DSCA 160A is used**
  As DSCA 160A is not existing in Advant Controller 450, the application made on the board must be translated to another, for Advant Controller 450, valid board.

  A suggestion would be to invoke the application on the CI535, free-programmable communication module.
- **If free-programmable board DSPU 140 is used**
  As DSPU 140 is not existing in Advant Controller 450, the application made on the board must be translated to another, for Advant Controller 450, valid board.

  A suggestion would be to invoke the application on the PU535, free-programmable module.
- **If only MasterAid 21X is available**
  For configuration and maintenance of the Advant Controller 450*1.0 an Advant Station 100 Series Engineering Station with software version 1.4 or later is required (for later versions of the controller also later versions of the tool software must be used). That is, MasterAid 215 and older versions of service tools can not be used.
- **If BU specific products are used**
  When BU developed software and/or hardware is used in the system to be upgraded, please contact the responsible BU for information regarding special considerations that need to be taken.

1.7 References

Document	Identity
Advant Controller 450, User’s Guide	3BSE002415R0001
Data Base Elements, Advant Controller 400 Series, Reference Manual	3BSE002422R0001
PC Elements, Advant Controller 400 Series, Reference Manual	3BSE002418R0001
AMPL Configuration, Advant Controller 400 Series, Reference Manual	3BSE002417R0001
Source Code Handling, User’s Guide	3BSE003838R0001
Terminal diagram forms, MasterPiece 200/1∗4.0	5710 053-S
Terminal diagram forms, Advant Controller 450 ∗1.0	3BSE005972
Module Revision Index, Advant Controller 410/450	3BSE007001

NOTE

The above listed manuals refer to Advant Controller 450, version 1.0.
If a later version of the Advant Controller 450 is to be used please refer to the relevant user documentation. A list of documentation can be found in the *Release Notes* for the Advant Controller 450.

Chapter 2 Configurations

2.1 CPU Subrack (AC) in a New Cabinet

Figure 2-1 shows a RE500 cabinet with CPU subrack (AC), power supply (redundant), power switch, mains distribution, 24V distribution and a modem subrack.

The modem subrack must be used for the MasterFieldbus which needs 1 modem per single or redundant bus. If 2 or less modems are used (totally) they can be placed on a plate mounted to the left of the CPU subrack (AC).

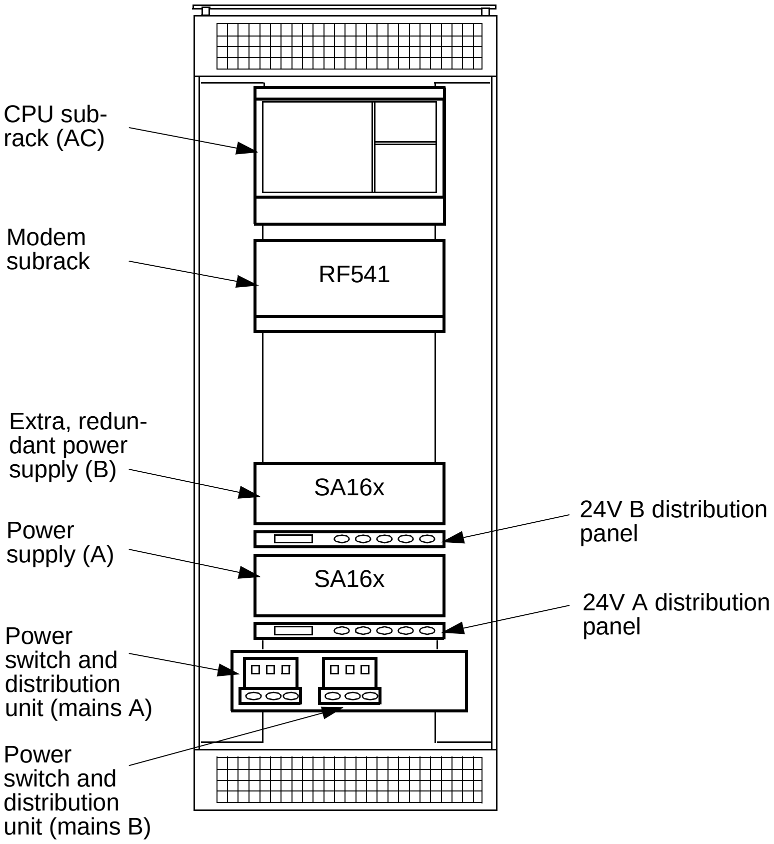

CPU subrack (AC)
Modem subrack
RF541
Extra, redundant power supply (B)
SA16x
24V B distribution panel
Power supply (A)
SA16x
24V A distribution panel
Power switch and distribution unit (mains A)
Power switch and distribution unit (mains B)

Figure 2-1. RE500 Cabinet with CPU Subrack (AC)

2.1.1 Electrical Bus Extension to S100 I/O

This configuration implies a standard cabinet (type RE500 or VSH 200) with CPU subrack (AC) and power supply. If enough power is available from existing power supply in the MasterPiece 200/1 cabinet, this can be used for the CPU subrack (AC).

The new cabinet must be placed nearby the old MasterPiece 200/1 cabinet. Since the S100 I/O bus extension cable length is limited to 12 meters, the new cabinet must be placed close to either end of the bus cable in the MasterPiece 200/1

The old CPU subrack (MP) is rebuilt to an I/O subrack and connected to the new CPU subrack (AC) with the bus extension cable. It is also possible to connect the bus extension cable to the last I/O subrack (turn the bus around).

Advantages

- Small mechanical adjustments in old equipment.
- Short erection time.
- CPU subrack (AC) already installed and tested in cabinet on delivery.

Disadvantages

- Requires space close to old cabinet.
- Rerouting of communication cables to new cabinet is necessary.
- Supervision of redundant power supply, if any, must be rerouted to new cabinet.

2.1.2 Optical Bus Extension to S100 I/O

This configuration implies a standard cabinet (type RE500 or VSH 200) with CPU subrack (AC) and power supply connected via the optical bus extension to S100 I/O (see Appendix D for a complete description of the optical bus extension).

The new cabinet must be placed within 500 meters from the old MasterPiece 200/1 cabinet.

The old CPU subrack (MP) is rebuilt to an I/O subrack and connected to the new CPU subrack (AC) with the bus extension cable. It is also possible to connect the bus extension cable to the last I/O subrack (turn the bus around).

Advantages

- Greater freedom to find a suitable place for the cabinet.
- Small mechanical adjustments in old equipment.
- Short erection time.
- CPU subrack (AC) already installed and tested in cabinet on delivery.

Disadvantages

- Rerouting of communication cables to new cabinet is necessary.
- Supervision of redundant power supply, if any, must be rerouted to new cabinet.

2.2 CPU Subrack (AC) in an Existing VSH 200 Cabinet

This configuration implies mounting the new CPU subrack (AC) on the rear wall inside the same cabinet, where the CPU subrack (MP) is mounted or nearby the last I/O subrack.

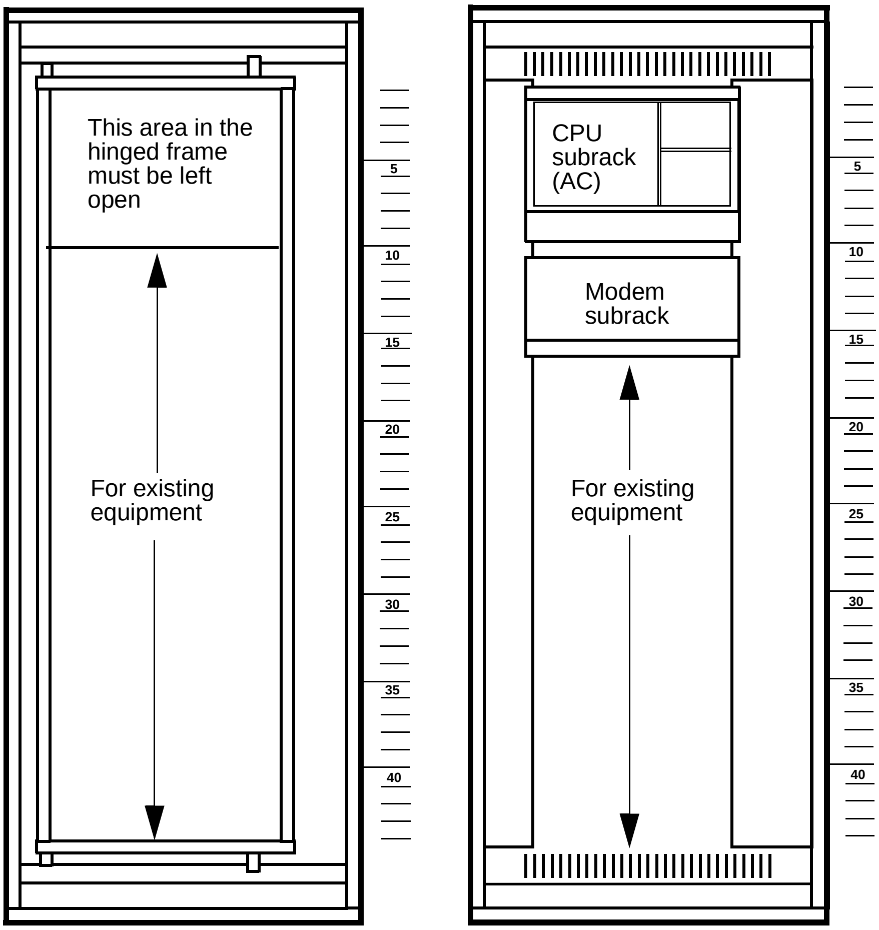
The old CPU subrack (MP) is rebuilt to an I/O subrack and connected to the new CPU subrack (AC) via the S100 I/O bus extension.

Advantages

- No new cabinet space required.
- Old power supply can probably be used.

Disadvantages

- No subracks can be mounted in the hinged frame opposite the area on the rear wall where the CPU subrack (AC) is placed. If so, the hinged frame will be impossible to close.
- There is a risk that a lot of work must be done to rearrange subracks, connection units and cables in the cabinet (and perhaps also in adjacent cabinet). It is likely that connection units for S100 I/O are already located where the CPU subrack (AC) is to be mounted. These must be moved somewhere else. Therefore, this is generally not a suitable solution for systems housing lots of S100 I/O in the cabinet where the CPU subrack (AC) is to be placed.
- A modem subrack is normally used for 3 modems or more (MasterFieldbus has 1 modem per single or redundant bus) if not other arrangements can be done.
- A substantial amount of work must be spent on testing the new configuration.



With the hinged frame closed **With the hinged frame removed**

Figure 2-2. Example of a VSH 200 Cabinet with CPU Subrack (AC)

2.3 CPU Subrack (AC) in Other Cabinet

The “other” cabinet is typically an existing, non-Master, cabinet housing the CPU subrack (MP) or a cabinet being situated close to the MasterPiece 200/1 to be upgraded.

This configuration implies mounting the CPU subrack (AC) in the other cabinet. The CPU subrack (MP) is rebuilt to an I/O subrack and connected to the CPU subrack (AC) via the bus extension cable (max length is 12 meters).

The cabinet in which the CPU subrack (AC) is to be mounted shall comply to the same interference immunity rules as the standard ABB Master cabinet and shall be grounded to a common earth plane.

Advantages

- No new cabinet space required.

Disadvantages

- It can be necessary to make rearrangement of the old equipment in the cabinet to create space for the CPU subrack (AC) (and perhaps also a modem subrack).
- Power supply to the new Advant Controller 450 CPU subrack must be arranged for either by installing a new power supply unit or by connecting the subrack to an existing supply unit. In the latter case the capacity of the existing supply unit must be considered.

Starting with the existing cabinet a careful redesign of the cabinet contents must be made prior to the installation of the CPU subrack (AC). Please, study Figure 2-1 and 2-2 for ideas.

Chapter 3 Hardware

3.1 Hardware Summary

3.1.1 Basic Unit

Table 3-1. CPU Subrack in MasterPiece 200/1

Hardware in MasterPiece 200/1	Action Taken when Upgrading
CPU subrack (MP)	A. Rebuild the subrack as a I/O subrack. See information in Appendix A. B. Replace with a CPU subrack (AC). If any S100 I/O boards were placed in CPU subrack (MP) then move them to other I/O subracks.

3.1.2 Communication Boards

Table 3-2. Communication Boards and Modems in MasterPiece 200/1

Hardware in MasterPiece 200/1	Action Taken when Upgrading
DSCS 140, MasterBus 300	Replace by submodule CS513. Connection unit DSTC 190 is not used any more.
DSCS 145, MasterBus 300E	Replace by submodule CS513. Connection unit DSTC 190 is not used any more.
DSCA 125A (DSCA 125), MasterBus 200	**Function is not supported.**
DSCA 150, MasterBus 100	**Function is not supported.**
DSCS 150, GCOM	Replace by submodule CS513. Connection unit DSTC 190 is not used any more.
DSCS 131 (DSCS 130), MasterFieldbus	Replace by submodule CI570. Replace connection unit DSTC 408 by modem TC570.
DSCA 180A, RCOM	Replace by submodule CI532V01. Connection unit DSTC 120 is not used any more.
DSCA 180B, MVI for MODBUS	Replace by submodule CI532V02. Connection unit DSTC 120 is not used any more.
DSCA 180F, MVI for Siemens 3964 (R)	Replace by submodule CI532V03. Connection unit DSTC 120 is not used any more.

Table 3-2. Communication Boards and Modems in MasterPiece 200/1 (Continued)

Hardware in MasterPiece 200/1	Action Taken when Upgrading
DSCA 114, RS-232-C	Replace by submodule CI531. **Note!** Only 2 channels on CI531. Built-in modems on DSCA 114 must be replaced by external modems, for example TC562, DSTC X008 or equivalent. Connection unit DSTC 120 is not used any more.
DSCA 160A, Programmable interface board	**Function not supported.** Possible solution is to convert the application to C code and use the submodule CI535.
DSPU 140, Free-programmable board	**Function not supported.** Possible solution is to convert the application to C code and use the submodule PU535.
DSTC X008 (or KM-1D), Short distance modem	Can still be used. For connection to submodules, the cable must be replaced.

Each submodule must be placed on one of the following Submodule Carriers: SC510, SC520 or SC530. To select the proper submodule carrier please refer to the *Advant Controller 450 documentation*.

3.1.3 I/O Boards and Electrical Bus Extension

Table 3-3. I/O Boards in MasterPiece 200/1

Hardware in MasterPiece 200/1	Action Taken when Upgrading
S100 I/O, Local I/O	All S100 I/O boards used in MasterPiece 200/1∗4.0 can still be used.
S400 I/O, Remote I/O	All S400 I/O units used in MasterPiece 200/1 can still be used.

Table 3-4. S100 I/O Electrical Bus Extension Boards in MasterPiece 200/1

Hardware in MasterPiece 200/1	Action Taken when Upgrading
DSBC 171	Replace by DSBC 173A
DSBC 173	Replace by DSBC 173A

Table 3-5. Old Boards Not Found in Advant Controller 450 but still Supported

Hardware in MasterPiece 200/1	Action Taken when Updating
DSAI 130H, AI board	Can still be used
DSAI 135, AI board	Can still be used
DSDI 110, DI board	Can still be used
DSDI 120, DI board	Can still be used
DSDI 131, DI board	Can still be used
DSDI 141A, DI board	Can still be used
DSHC 110, MasterView 100	Can still be used

3.1.4 Power Supplies

Table 3-6. Power Supplies in MasterPiece 200/1

Hardware in MasterPiece 200/1	Action Taken when Upgrading
DSSA 160/165/170, 24 V Power supplies DSSX 160 - 164 Power switches DSSX 165/166 Distribution terminal	The power supplies, switches and distribution units can still be used both for the rebuilt CPU subrack (MP) or for the CPU subrack (AC). **Note!** Consider the increased power consumption caused by the CPU subrack (AC) by making a calculation of the load current on 24V DC.
DSSS 170, Diode unit	CPU subrack (AC) has a built-in diode unit and need no DSSS 170. A rebuilt CPU subrack (MP) to a I/O subrack (and other I/O subracks) still needs DSSS 170. Otherwise DSSS 170 can be removed.
DSSR 122 (DSSR 120), Voltage regulator	Replace by SR511 when CPU subrack (AC) is used. In a rebuilt CPU subrack (MP) the DSSR 122 (120) is still used.
DSSR 170 (5 pieces), Redundant voltage regulator	Replaced by two SR 511 when CPU subrack (AC) is used. In a rebuilt CPU subrack (MP) the 5 pieces of DSSR 170 can still be used but only 3 pieces are necessary to use.
DSSB 120, Battery charger/back-up	Replace by Back-up Power Supply SB510 for ac mains or SB511 for dc mains. Battery package SB520 must be used.

3.2 Mechanical Arrangements

3.2.1 CPU Subrack (AC) in a New Cabinet

No mechanical arrangements except from making room for the new cabinet (RE500 or VSH 200) needs to be taken into account. The CPU subrack (MP) can be rebuilt to an S100 I/O subrack according to Appendix A.

Please refer to Figure 2-1.

3.2.2 CPU Subrack (AC) in an Existing VSH200 Cabinet

3.2.2.1 Location of New CPU Subrack

The CPU subrack (AC) is to be located in the rear of the cabinet at the highest position of the mounting plane B. If connection units are placed here in the old configuration, these have to be moved somewhere else, possibly down below the CPU subrack (AC). The area in the hinged frame opposite to the CPU subrack (AC) must be left open in order to have access to the CPU subrack (AC) when the hinged frame is closed. See Figure 3-1.

The CPU subrack (AC) (including fan unit) occupies 9 U-modules (1 U = 44.45 mm) of the mounting plane B.

3.2.2.2 Actions to be Taken with CPU Subrack (MP)

If the CPU subrack (MP) is to be rebuilt to an I/O subrack, all boards, which no longer are supported or must be replaced (according to the tables above), are removed from the system, including their connection cables and connection units.

Information about rebuilding CPU subrack (MP) to an I/O subrack is found in Appendix A.

3.2.2.3 New Location for Connection Units

As the configurations are all individual it is not possible to give a general recommendation as to where to put them. However, the intention would be to move them as short distance as possible. Maybe dismounted connection units for communication leaves space enough for the connection units to be moved.

3.2.2.4 Location of Modem Rack and Modems

In the cases where the MasterFieldbus (or the Advant Fieldbus 100) are used there is a modem subrack to be placed in the cabinet in order to house the modems TC570, TC625 and TC630. This modem subrack (RF541) should be placed right below the CPU subrack (AC). The modem subrack occupies 6 U-modules of the mounting plane.

NOTE

Up to two modems can be placed on a mounting plate (RA544) to the left of the CPU subrack (AC).

3.2.2.5 Location of Battery Unit

The battery unit is mounted on the right hand side on the inside of the cabinet. For VSH 200 there exists an adapted battery unit consisting of the regular battery unit (SB520 and TK460) and a suitable mounting plate.

3.2.3 CPU Subrack (AC) in Other Cabinet

The same considerations must be taken as for the case above when placing the CPU subrack (AC) in the back of the MasterPiece 200/1 cabinet.

Be sure to install the cabinet, the CPU subrack (AC) and the modem subrack, if any, according to the ABB Master Installation rules. Special concern should be taken regarding the grounding of the CPU subrack (AC) and the modem subrack.

Further information is found in the *Advant Controller 450, User’s Guide*.

3.3 Electrical Arrangements

3.3.1 General Information about Power Supply

3.3.1.1 24 V A Supply

The 24 V A supply used in the old MasterPiece 200/1 installation can be utilized for the CPU subrack (AC) as well, if the increased load current caused by the CPU subrack (AC) does not force the load current on the supply unit (DSSA 160/165, DSSA 150A...) to exceed its limits.

If the existing supply unit is not sufficient for the new configuration an additional supply unit (SA161/162/167/168, DSSA 160/165 or DSSA 150A) and distribution panel SX554 must be installed in order to supply the CPU subrack (AC) with 24 V A.

In order to determine whether or not the existing power supply is sufficient for the new configuration, please refer to the technical documentation for the different units.

3.3.1.2 24 V B Supply

The same aspects as for the 24 V A supply must be considered for 24 V B.

NOTE

The CPU subrack (AC) must be powered with 24 V A and 24 V B directly (not via any external diode unit, e.g. DSSS 170).

3.3.1.3 Regulators

The regulators for CPU subrack (AC), SR511, are placed in the subrack. Therefore the old regulators from CPU subrack (MP) need not be relocated but are used in the case that the CPU subrack (MP) is rebuilt to an I/O subrack.

3.3.1.4 Battery Backup

The battery backup for the CPU subrack (MP) is dismounted and replaced by the back-up power supply (SB510 if ac mains is used or SB511 if dc mains is used), battery package (SB520) and cable (TK460) for the CPU subrack (AC).

3.3.2 Re-routing Cables

3.3.2.1 Supervision and System Signals

System supervision and system signals must be re-routed from their previous connections to the new status collector board, TC520. TC520 is located at the lower right in the CPU subrack (AC).

Both input and output signals are concerned and must be moved to TC520.

Table 3-7. Re-routing of Supervision and System Signals to TC 520

Input/ Output	Description	To be Moved from	To be connected to TC520, Terminal	Remark
Input	Supervision of I/O 24 V A	DSTC 175	A1 and AG	AG is common to A1 and A2
Input	Supervision of I/O 24 V B	DSTC 175	A2 and AG	
Input	External clock synchronization	DSSB 140/145/146	S and SG	
Input	F1	DSTC 175	B1 and BG (Signal F3)	BG is common to B1 and B2
Input	F2	DSTC 175	B2 and BG (Signal F4)	
Output	Run signal from CPU L	DSSB 140/145/146	RA and RA (relay)	
Output	Run signal from CPU R	DSSB 140/145/146	RB and RB (relay)	

The supervision signal of the fan unit for the CPU subrack (AC) shall also be connected to TC520 (contact FN).

NOTE

Signal cables, connected to TC520, may not be extended outside the controller cabinet installation due to the risk of interferences. Please refer to *Advant Controller 450, User's Guide*.

3.3.2.2 Cables for S100 I/O Bus Extension

Electrical Bus Extension

CI540 in the CPU subrack (AC) can be connected to either end of the existing bus extension cable between the I/O subracks, see Figure 3-1.

The following cables can be used for the S100 I/O electrical bus extension.

- **At the I/O subrack**
  All I/O subracks must be provided with a short flat ribbon cable called DSTK 183. One end is connected to the bus extender DSBC 173A and the other must be fixed on the outside of the right side plate of the subrack by two screws (subrack DSRF 182) or by a cable strap (nylon) mounted with two strap holders (self-adhesive) attached to the side plate (subrack DSRF 172).
- **Between CI540 and the I/O subrack**
  Only one cable can be used and that is TK575 with the length 2.5 meters.
- **Between two I/O subracks**
  Different cables can be used.

Table 3-8. Cables for S100 I/O Electrical Bus Extension

Cable	Length	Remarks
DSTK 184	3.0 m	Round ribbon cable
DSTK 185	5.0 m	Round ribbon cable
DSTK 195	0.5 m	Flat ribbon cable. Intended for use between two I/O subracks in the same hinged frame in VSH 200 cabinet.
TK517V010	1.0 m	Round ribbon cable
TK517V035	3.5 m	Round ribbon cable

All cables above can be mixed with each other.

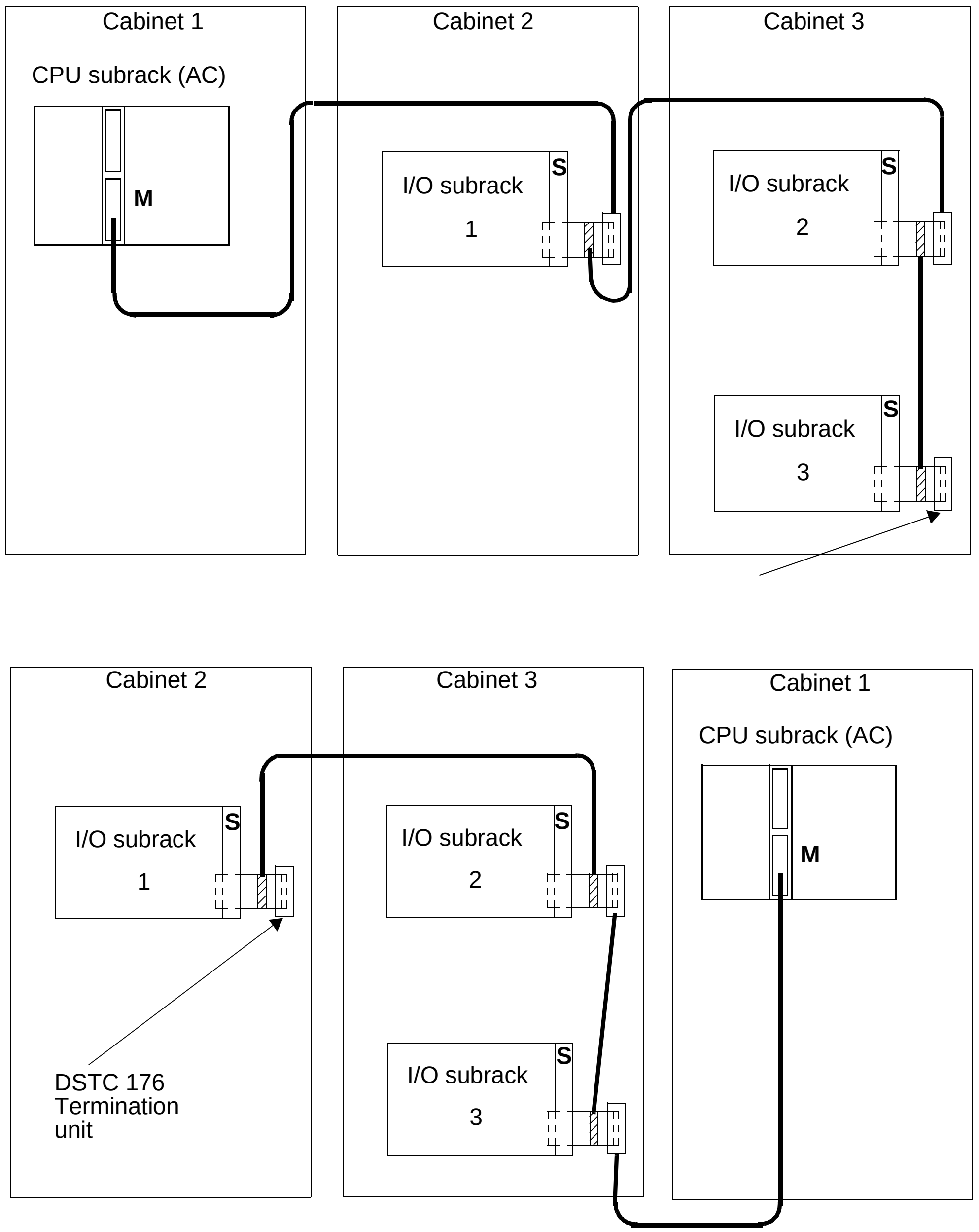
- **At the last I/O subrack**
  The termination unit, DSTC 176, must be connected to the last subrack.

NOTE

Try to route the bus extension cables apart from other cables. The maximum total length of the electrical bus extension cable must not exceed 12 meters.

Optical Bus Extension

Please refer to Appendix D Optical Bus Extension for S100 I/O.



M indicates master module CI540
Connection on module front

S indicates slave module DSBC 173A
Connection from behind

Figure 3-1. Two Methods of Connecting the Electrical Bus Extension from CI540

3.3.2.3 Cables for Power Supplies

24 V A Supply

If the 24 V A used by the old MasterPiece 200/1 is to be used for the CPU subrack (AC) as well, make a connection from the old 24 V A supply units output to the 24 V A input of the CPU subrack (AC). Contacts for 24V A on the CPU subrack (AC) is found in the upper part of the backplane.

If an additional supply unit is required for the CPU subrack (AC), this supply unit should be fed from the same source as the existing supply unit and connected after the main power switch.

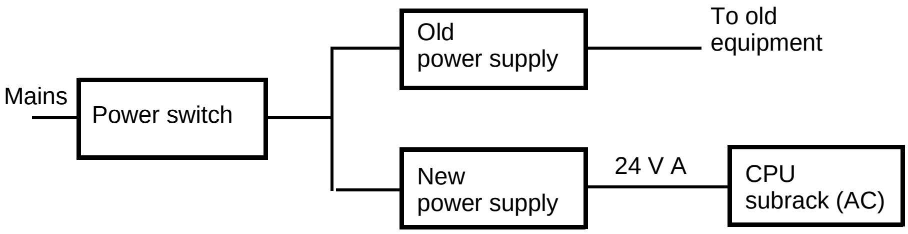


Figure 3-2. Connection of New Power Supply

24 V B Supply

The actions taken with 24 V A is valid for 24 V B as well.

NOTE

If diode unit DSSS 170 is used in the original configuration, both 24 V A and 24 V B to the CPU subrack (AC) shall be taken out **before** the diode unit.

Back-up Power Supply

The back-up power supply in CPU subrack (AC) needs normally 120/230 V ac (SB 510), supplied through a power cord with an IEC connector, in order to operate. Route the power cord from the front of the back-up power supply to the terminals on the power switch that earlier were used for suppling power to the removed DSSB 120 (screw terminals).

3.3.3 Adaptations of Communication Cables to New Boards

3.3.3.1 Bus Controller for MasterFieldbus

The cable to contact X90 on the DSTC 408 can be fitted into the unit TC570. Re-route from DSTC 408 to TC570.

3.3.3.2 MVI Communication (including RCOM)

Table 3-9. MVI Communication

Cable	Action to be Taken
Cables connected to the connection unit DSTC 120 for DSCA 180A, RCOM DSCA 180B, Modbus DSCA 180F, Siemens 3964 (R)	As the cable contact differ between the connection unit DSTC 120 and the submodule CI532Vxx the options are: 1. Cut the existing cable, re-route and change the contact. 2. Purchase an adaptation cable. 3. Make an adaptation cable according to Appendix B.

If modem DSTC X008 (KM-1D) has been used, the cable between the modem and the communication submodule, CI532Vxx, shall be TK577.

3.3.3.3 MasterBus 300

Re-route the transceiver drop cable from the old connection unit DSTC 190 to the front of the submodule CS513.

3.3.3.4 GCOM

Re-route the transceiver drop cable from the old connection unit DSTC 190 to the front of submodule CS513.

3.3.3.5 RS-232-C Communication

Table 3-10. RS-232-C Communication

Cable	Action to be Taken
Cables connected to the connection unit DSTC 120 for DSCA 114, RS-232-C communication	As the contact differ between the connection unit DSTC 120 and the submodule CI531 the options are: 1. Cut the existing cable, re-route and change the contact. 2. Purchase an adaptation cable. 3. Make an adaptation cable according to Appendix B. **Note!** If the current loop interface on DSCA 114 has been used, an additional modem (for example TC562 or DSTC X008) must be mounted. Move the connections from the DSTC 120 to modem (see Appendix B). Use cable TK595 (for TC562) or TK577 (for DSTC X008) between modem and CI531 or make a new cable according to Appendix B.

Chapter 4 Software

4.1 General Information

The application software in MasterPiece 200/1 is transferrable to Advant Controller 450 by means of source code handling in the same way as when moving application between different versions of MasterPiece 200/1.

The greatest difference in application software between MasterPiece 200/1 and Advant Controller 450 is that all submodules in Advant Controller 450 must be configured in the data base. That is, for all submodules (except CS513 and MB510 who are auto-configured) a corresponding data base element must be created and accordingly filled in.

It is recommended that the transfer of the software is made prior to installing the new Advant Controller 450 in order to minimize the damage arising if the transfer for some reason should fail. This is possible since the dumping of the MasterPiece 200/1 can be made in advance and the dumps loaded in a temporary installed Advant Controller 450. If the Advant Controller 450 is thereafter dumped with command DUAP, the time for loading of application software will be greatly reduced when upgrading the system.

NOTE

Read Chapter 5 Restrictions to see if any of the restrictions mentioned is applicable to your PC program.

4.2 Actions to be Taken

This section lists the different actions to be taken when moving the application software between the systems. The different steps are more thoroughly explained in sections below.

AT ALL STAGES

Pay attention to the impact the actions taken have on the process connected to the system.

1. Print out, or take notes of, how the data base is dimensioned in the MasterPiece 200/1 (DIMDB).
2. Dump the data base source code by means of command DUDBS.
3. Print out, or take notes of, how the PC part is dimensioned in the MasterPiece 200/1 (DIMPC). Check symbol table size with MSTABS and note it down.
4. Dump the PC source code of all PC programs in the MasterPiece 200/1 by means of command DUPCS.
5. Take a security dump of the application software in the MasterPiece 200/1 by means of command DUAP.
6. Start up the Advant Controller 450 with a “CLEAR” init.

7. Dimension the data base in the Advant Controller 450 according to the printout of how the MasterPiece 200/1 was dimensioned. Command DIMDB. If new functions that need to be dimensioned for (DIEV, AIEV etc.) are to be utilized, this has to be taken into account as well.
8. Load the data base source code by means of command TRDBS.
9. Create and modify the data base elements for the submodules which so require (AC450, CI531, CI532Vxx, CI540, CI570...)
10. Dimension PC with help of command DIMPC. Change MSTABS according to the note taken above.
11. Load the PC source code by means of command TRPCS.
12. Start up the system with command DICONFIG.
13. Check that all configured boards start up in a correct way.
14. Disable build mode and deblock the PC programs.
15. Verify that the system functions work properly.
16. Take back-up of new system with command DUAP.

4.3 Data Base

4.3.1 Dumping of Data Base Source Code

Be sure to dump with element selection “ALL” and to include table data in dump, if tables are used in the system.

4.3.2 Editing the Dumped Source Code

In the normal case there is no reason to alter the dumped source code, but if this should be required, it can be done by the editor AMIS invoked on Advant Station 100 Series ES.

If no tuning of the parameters for MasterBus 300 is used, it’s recommended to remove the corresponding data base elements BM, NM, TL and TU from the source code.

4.3.3 Redimensioning of the Data Base

Normally no changes need to be made to the dimensioning of the data base when an application is moved from MasterPiece 200/1 to Advant Controller 450.

But for some of the **new** functions in Advant Controller 450 the data base need to be dimensioned accordingly, if they are to be used:

- Units on Advant Fieldbus 100
- Event sets
- AI events
- DI events
- DSP (DataSet Peripherals) and its DATs

4.3.4 Data Base Elements not Used Any More

The following data base elements are not used any more and should be removed from the source code.

- MB100
- MB200
- MP100T
- NL
- RSCOM

4.3.5 New Data Base Elements

4.3.5.1 Element AC450

The Advant Controller 450 has a new data base element called AC450.

This element contains information about how the system is configured regarding power supplies (24 V, regulators, battery etc.) and user defined signals (F1, F2 etc.).

It gives also information about the current modules in the CPU subrack (AC).

Most of the information in data base element AC450 is to be entered by the user.

The data base element is created by the system and reached by command MDB AC450.

4.3.5.2 Elements for Submodules

As mentioned above, all submodules to be located in the system need a data base element in order to function.

This data base element contains information such as location and setup of the submodule.

The data base elements need to be created manually with the following two exceptions: CS513 and MB510. These two types of submodules are recognized by the system at start up and the corresponding data base elements (CS513, MB510) are configured by the system.

For all other submodules the corresponding data base elements need to be created by means of command CRDB.

The call name when creating the data base element is the same as the name of the submodule, that is, if you intend to put a submodule of type CI531 in the system you create the data base element by giving command:

```
CRDB CI531
```

Once created, the data base element will be given an item designation by the system. This item designation is used when connecting the data base element to PC programs and when modifying the data base element with command MDB.

If, for example, the data base element CI531, was the first CI531 to be created, the system would give the data base element the item designation RS232_1. The next would be called RS232_2 and so on.

Below is a cross-reference to show which item designation is given to the different types of submodules.

Table 4-1. Cross-reference between Submodules and Item Designations

Data Base Element name at CRDB (Submodule)	Data Base Element name at MDB	
	Item Design.	**Value of x**
CI520	AF100_x	$1 \leq x \leq 4$
CI531	RS232_x	$1 \leq x \leq 4$
CI532	MVIx	$1 \leq x \leq 5$ (1)
CI535	MVIx	$1 \leq x \leq 5$ (1)
CI540	S1BE_1	–
CI570	MFx	$1 \leq x \leq 7$
M500	M500_x	$1 \leq x \leq 12$
PU535	FPMx	$1 \leq x \leq 10$

(1) (No of CI532) + (No of CI535) ≤ 5

The data base elements CI540 and CI570 **must** be created in order to activate the S100 I/O boards and S400 I/O units.

See *Data Base Elements, Advant Controller 400 Series* for further information of how to fill in the data base elements.

4.3.6 Loading of Data Base Source Code

The data base source code dumped from the MasterPiece 200/1 is loaded into the Advant Controller 450 in the normal way by command TRDBS.

4.4 PC Program

4.4.1 Dumping of PC Source Code

The PC programs are dumped in source code format with help of command DUPCS.

Find out which programs are present in the system with command LSS.

Dump the programs:

Example:

PC2 is the first program and PC36 the last

```
DUPCS PC2>PC36/SRCE:FILE=200
```

4.4.2 PC Elements no Longer Valid

The following PC elements have been removed in Advant Controller 450:

- STATUS (Status signals from MasterPiece 200/1.
- FPB-COM (Elements for Free-Programmable Board DSPU 140)
  FPB-I
  FPB-IA
  FPB-O
  FPB-OA
- PCB-COM (Elements for Programmable Interface Board DSCA 160A)
  PCB-I
  PCB-IA
  PCB-O
  PCB-OA

4.4.3 Editing the Dumped Source Code

In the normal case there is no reason to alter the dumped source code but if this should be required it can be done by the editor AMIS invoked on Advant Station 100 Series ES.

If any of the elements listed above has been used in the MasterPiece 200/1 to be upgraded these elements, and their connections, have to be removed from the source code.

4.4.4 Redimensioning

No changes need to be made in the dimensioning of the PC area when an application is moved from MasterPiece 200/1 to Advant Controller 450.

Note that MSTABS might be used to adjust the symbol table size if needed.

4.4.5 New PC Elements

New PC Elements in Advant Controller 450 are:

- PIDCONA (New adaptive, selftuning PID-controller)
- COM-STAT (Communication and system supervision)
- FPM-COM (Elements for Free-Programmable Module PU535)
  FPM-I
  FPM-IA
  FPM-O
  FPM-OA

See *PC Elements, Advant Controller 400 Series* for further information of how to use the PC elements.

4.4.6 Loading of PC Source Code

The PC source code dumped from the MasterPiece 200/1 is loaded into the Advant Controller 450 in the normal way by the command TRPCS.

NOTE

You will need a new project/target on Advant Station 100 Series ES in order not to cause conflict in USER-files. When you have created a new project, the PC source code files (*.AA) can be copied with DOS command COPY from the old project's SRCE-directory to new project's SRCE-directory and then transferred into the system.

4.5 Merging Two MasterPiece 200/1 into One Advant Controller 450

4.5.1 General Information

Merging two MasterPiece 200/1 into one Advant Controller 450 can be done if the limits set by Advant Controller 450 is not exceeded by the tasks performed in the existing configuration.

Some of the questions to be asked are:

- Is the total number of I/O subracks 5 or less?
- Is the S100 I/O bus extension cable 12 m or less?
- Is the sum of signals, boards, DATs, MOTCONs etc. within limits of Advant Controller 450?
- Is the memory in Advant Controller 450 sufficient for the sum of applications?
- Is the CPU capacity in Advant Controller 450 sufficient for the sum of applications?

Furthermore, extensive knowledge about source code handling and source code syntax of both DB and PC is required in order to perform a merger.

Due to the alterations that has to be made in the source code when doing a merger it is even more strongly recommended that you perform the merger "off-line", that is, prepare the source codes and load them into a temporary installed Advant Controller 450 in advance of starting any physical work.

4.5.2 Conflicts which Might Arise

The most common conflict that will arise is that boards, DAT elements, DICs and so on, occupy the same positions (addresses) in the two systems to be merged.

The solution to this problem is to make changes in one of the system's source codes so that, for each function where conflicts arise, the numbering (addressing) of the function starts right after where it ends in the other system.

Example:

> DI1 exists in both systems. Then DI1 in the second system has to be changed into the first unoccupied position of the first system. If DI1 -> DI5 exist in the first system then DI1 in the second system must be changed to DI6.

Names of data base signals must not conflict between the nodes to be merged together.

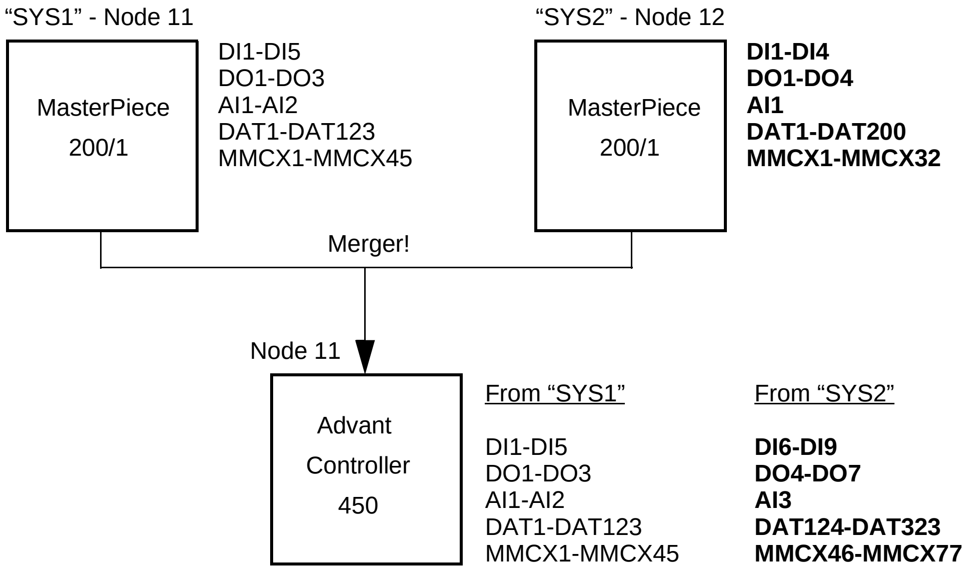


Figure 4-1. Example of Merger of Data Base Signals

4.5.3 Suggested Working Method

The principle is to upgrade one of the MasterPiece 200/1 and keep its software much the same way it was. This system is referred to as "SYS1". The application software in the other MasterPiece 200/1, "SYS2", is then adjusted to fit to the software present in "SYS1".

In a network there will be a node less, the node for "SYS2" will disappear, and the new Advant Controller 450 shall inherit its node number from "SYS1".

1. Decide which one of the two MasterPiece 200/1 that shall be "SYS1" and which is to be "SYS2".
2. Take notes of the settings of the symbol table size (MSTABS) in both "SYS1" and "SYS2".
3. Upgrade "SYS1" according to the normal upgrade procedure.

NOTE

When dimensioning the new Advant Controller 450 the figures from the dimensioning of "SYS1" must be added to the ones of "SYS2" in order to result in the figures to enter for the merged node. This concerns both data base and PC.

4. Make a listing of the data base content in both the upgraded Advant Controller 450 (“SYS1”) and the remaining MasterPiece 200/1 (“SYS2”) with command LDBD.
5. Compare the listings and determine where conflicts arise.
6. Make notes in the listing from “SYS2” about how to change to avoid conflicts.
7. Dump the data base source code from “SYS2”.
8. Edit the dumped data base source code according to the notes made in the listings. The editing mainly consists of renumbering.

NOTE

If MasterFieldbus is used, the easiest way is to change entire buses, that is, if bus 1,2,3 and 4 is used in “SYS1” and bus 1 and 2 was used in “SYS2”, bus 1 is changed to bus 5 and bus 2 to bus 6 in the source code of “SYS2”. In the source code this is done by replacing all instances as follows:

In source code	**Change to**
DX1	DX5
AX1	AX5
DX2	DX6
AX2	AX6
:BUSNO 2	BUSNO 6

Further more, the source code must be browsed in order to find all units now on bus 5 (DX5xx, AX5xx). The following line must be added right after the header for each unit:

:BUSNO 5

NOTE

For all TTDVAR where the connection NODE is set to the node number of the disappearing node, “SYS2”, the node number must be changed to the node number of the new Advant Controller 450 node.

9. Check what PC programs are being used in “SYS1” (LSS).
10. Dump the PC source code from “SYS2” with option D in order to omit all scan table positions from dump.
11. Edit the resulting PC source codes so that the PC program numbers do not conflict with each other (change PC-program numbers).
12. Load the edited data base source code into the new Advant Controller 450.
13. Locate the Data Sets sent between the two MasterPiece 200/1 that has been merged together and deactivate them.

NOTE

The signals that have been sent between the nodes with Data Sets must be replaced with DATs between programs instead. Use the PC element MOVE.

14. All the nodes on the network, if any, must be checked for Data Sets sent to/received from the former “SYS2”. These Data Sets shall be re-directed to the new Advant Controller 450 node. This is done by changing the value on the Data Sets NODE-tag.
15. Load the edited PC source code from “SYS2” into the new Advant Controller 450. Remember to change the symbol table size with MSTABS to a number greater than the sum of the symbol table sizes from former “SYS1” and “SYS2” before loading the source code.
16. All operator stations on the network having objects that was previously located in “SYS2” must have their name translations resolved.
17. Confirm proper function of the system and take a security dump with command DUAP.

4.5.4 Hardware

The “SYS1” in the section above is upgraded in the normal way to an Advant Controller 450.

“SYS2” CPU subrack (MP) may be rebuilt to a I/O subrack or the S100 I/O boards moved to free spaces in the new Advant Controller 450.

Communication cables from “SYS2” is re-routed to the new CPU subrack (AC).

S100 I/O boards and S400 I/O units from “SYS2” must have their addresses changed according to the changes made in the source code.

4.6 Tools for Handling Software in Advant Controller 450

The information in this chapter refers to Advant Controller 450, version 1.0. If a later version of the Advant Controller 450 is to be used, please refer to information in *Release Notes* for the used version.

4.6.1 Advant Station 100 Series Engineering Station

Advant Station 100 Series ES can be used together with Advant Controller 400 Series for configuration, service, maintenance and source code handling.

Following software is required for Advant Controller 450, version 1.0:

- QMA220, QMA221: MasterAid 220-FP*1.4/1 (or later versions/revisions)
- QMA222: FCE-FP*3.1/0 (or later versions/revisions)

4.6.2 MasterAid 220

MasterAid 220 can be used as an alternative to Advant Station 100 Series ES with the same requirements on software.

4.6.3 Advant Station 500 Series Engineering Station

Advant Station 500 Series ES can be used for configuration, service and maintenance of Advant Controller 400 Series including source code handling.

Following software is required for Advant Controller 450, version 1.0:

Advant Station 500 Series ES Software, version 2.1	(or later versions/revisions)

4.6.4 Advant Station 500 Series Operator Station

Advant Station 500 Series OS with option On-line Builder can be used for configuration, service and maintenance of Advant Controller 400 Series including source code handling.

The following software is required for Advant Controller 450, version 1.0:

Advant Station 500 Series OS Software, version 1.4	(or later versions/revisions)

4.6.5 Older Versions of Service Tools

Older version of service tools than those mentioned above may not be used together with the Advant Controller 400 Series.

This means that **MasterAid 213, 214 or 215 cannot be used!**

Chapter 5 Restrictions

5.1 Summary of Boards no Longer in Use

The following boards are supported in MasterPiece 200/1 but not in Advant Controller 450 and cannot be used after an upgrade to CPU subrack (AC):

DSBC 170	Bus repeater
DSBC 171	Bus repeater
DSBC 172	Bus repeater
DSBC 173	Bus repeater
DSCA 114	RS-232-C communication board
DSCA 125A DSCA 125	MasterBus 200 communication board
DSCA 150	MasterBus 100 communication board
DSCA 160A	Programmable interface board.
DSCA 180A	Remote communication (RCOM)
DSCA 180B	Modbus communication board
DSCA 180F	Siemens 3964(R) communication board
DSCA 190V	Application board for AccuRay 1190
DSCL 110A DSCL 110	Control unit for redundant CPUs
DSCS 131 DSCS 130	MasterFieldbus communication board
DSCS 140	MasterBus 300 communication board
DSCS 145	MasterBus 300E communication board
DSCS 150	Communication board for GCOM
DSMB 144	Memory board
DSMB 171	Memory board
DSMB 175	Memory board
DSMB 176	Memory board
DSPU 140	Free-programmable board
DSPC 170	CPU
DSPC 172	CPU
DSPC 172H	CPU

5.2 Software Functions no Longer Supported

- Back-up of application program on PROM
- Functional unit GENNOV. The functional unit is removed from Advant Controller 450.
- MasterBus 100 communication
- MasterBus 200 communication

5.3 Changed Functionality

The number of EXCOM communication buses and the number of MasterView 320 operator stations that can be connected to Advant Controller 450 are changed compared with MasterPiece 200/1.

Table 5-1. Number of EXCOM and MasterView 320

	No. of EXCOM	**No. of MasterView 320**
MasterPiece 200/1	3	4
Advant Controller 450	2	3

5.4 Size of RAM

Some Masterpiece 200/1 is configured with 2 DSMB 175 giving a total of 8 Mbytes for application programs. The Advant Controller 450 has a total 8 or 16 Mbyte RAM (depending on the CPU used) but this figure also includes the area used by the system software. Thus, the memory area that can be used for application program is less than 8/16 Mbyte.

The RAM area used by the different program modules:

Table 5-2. RAM Area for Program Modules

Program module	**RAM area in kbytes**
QC02-BAS21	1425
QC02-LIB21	30
QC02-LIB22	455
QC02-LOS21	245
QC02-OPF21	780
QC02-BAT21	405

The figures in Table 5-2 are valid for Advant Controller 450, version 1.0. For other versions please find actual figures in relevant documentation.

After dimensioning the data base and the command DICONFIG is given, then some more RAM area is allocated by the system software. The amount is depending of which functions that have been dimensioned. Please refer to *AMPL Configuration, Advant Controller 400 Series* for detailed information about how to calculate this area.

5.5 PC Element STATUS

The PC element STATUS is replaced by the PC element COM-STAT and a number of data base elements. The COM-STAT element have status information for the Masterbus 300, MasterBus 300E, GCOM and RCOM communication. All other information, that is found in the STATUS element, can in Advant Controller 450 be found in the data base elements for the corresponding function.

This means that a number of signals must be rerouted if the STATUS element was used in MasterPiece 200/1.

5.6 MasterNet Data Base Element TL

If the communication submodule CS513 is located on carrier module SC520 then NUMber of Transport Connection Control Blocks (NUMTCCB) on data base element TL1 is set to 200 by the system at start-up.

When loading a source code from MasterPiece 200/1 this value will be overwritten and set to 132!

Change the value back to 200 the following way:

```
MDB TL1
M6
200!
END
```

5.7 PC Element STEP

A functional parameter STEPNO is introduced.

Include the following line after STEP header in the source code:

```
:STEPNO       0
```

Appendix A Rebuilding CPU Subrack

A.1 Rebuilding MasterPiece 200/1 CPU Subrack to S100 I/O Subrack

To rebuild a MasterPiece 200/1 CPU subrack to a S100 I/O subrack the following steps must be performed.

1. Remove the battery backup unit.
   - DSSB 140 if static memory has been used in the MasterPiece 200/1.
   - DSSB 120 and DSSB 145/146 if dynamic memory has been used.
2. Remove the CPU board (DSPC 17x). If redundant CPUs are used, remove both CPUs.
3. If redundant CPUs are used remove the RCU board DSCL 110 or DSCL 110A.
4. Remove the memory board(s) (DSMB 171, DSMB 175 or DSMB 176) if present.
5. Substitute bus repeater board (DSBC 170 or DSBC 172) with bus repeater board DSBC 173A.
6. Substitute the bus extension cable between the removed bus repeater (DSBC 170 or DSBC 172) and the next I/O subrack with a cable from Table 3-8.
7. Disconnect connector X1 on DSTC 175 if present. The signals connected to DSTC 175 shall be re-routed according to the description in chapter 3.
8. Disconnect cables for Run Signal and Clock Synch on DSSB 140/145/146 and reroute the cables to TC520 in the CPU subrack (AC) (see chapter 3).
9. Connect the subrack (DSBC 173A) via connector on DSTK 183 to the S100 I/O bus interface, CI540, in the CPU subrack (AC), by means of cable TK575.
10. Remove all of the following boards from the subrack:
    - DSCA 114
    - DSCA 125A (DSCA 125)
    - DSCA 150
    - DSCA 160A
    - DSCA 180A
    - DSCA 180B
    - DSCA 180F
    - DSCA 190V
    - DSCS 131 (DSCS 130)
    - DSCS 140
    - DSCS 145
    - DSCS 150
    - DSPU 140
11. The fan unit for the CPU subrack (MP), DSRC 112 or DSRC 113, can be kept or removed. I/O subracks have normally no fan unit.

NOTE

The leftmost board places in the rebuilt I/O subrack must not be used. Be sure to mark this out in a such a way that no mistake can be made.

In a subrack for a single CPU:	The 4 leftmost board places can not be used.
In a subrack for redundant CPUs:	The 10 leftmost board places can not be used.

Appendix B Communication Cables

B.1 Communication Cable Connected to DSTC 120

If the cable previously connected to DSTC 120, contact X91 or X92, is cut and a new contact for the communication submodule in CPU subrack (AC) is to be mounted, the following connections shall be made.

The cable connected to DSTC 120 has a DSUB-25 female contact.

The cables connected to the communication submodules CI531, CI532Vxx, CI535 or PU535 in CPU subrack (AC) have a DSUB-9 female contact.

Table B-1. Re-routing of Cable from DSTC 120 to Communication Interface

Part connected to Pin on Female DSUB-25 for DSTC 120	Connect to Pin on Female DSUB-9 for Communication Submodule
2	3
3	2
4	7
5	8
6	6
7	5
8	1
20	4
22	9

B.2 Adaptation Cables for Serial Communications

If an adaptation cable is required between the contact previously connected to DSTC 120, contact X91 or X92, and the communication submodule in CPU subrack (AC), a cable according to the table below shall be made.

Table B-2. Adaptation Cable

Male DSUB-25	Female DSUB-9 for the Communication Submodule
2	3
3	2
4	7
5	8
6	6
7	5
8	1
20	4
22	9

B.3 Using External Modem instead of Built-in Modem on DSCA 114.

If the built-in modem on DSCA 114 was used in the not upgraded system, an external modem such as TC562 (or DSTC X008) must be installed instead. Below it is shown how the connections from DSTC 120 relate to those on the modem.

Table B-3. Re-routing of Connections from DSTC 120 to External Modem

Part connected to Terminal X90 on DSTC 120	Connect to Terminal on TC562 or DSTC X008
1 or 6	3
2 or 7	4
3 or 8	5
4 or 9	1
5 or 10	2

B.4 Cable Between External Modem and Communication Submodule

If an external modem (for example DSTC X008 or KM-1D) is connected to DSTC 120 a new cable is needed between modem and the communication submodule in the CPU subrack (AC).

This cable is available under the name TK577 and is 3 meters long.

For the modem TK562, a cable called TK595 (3 meters long) must be used.

B.5 Cable for Optical Bus Extension

See Appendix D Optical Bus Extension for S100 I/O.

Appendix C Dimensional Drawings

C.1 Subrack RF520

RF520 is the basic part of CPU subrack (AC) together with the fan unit RC510.

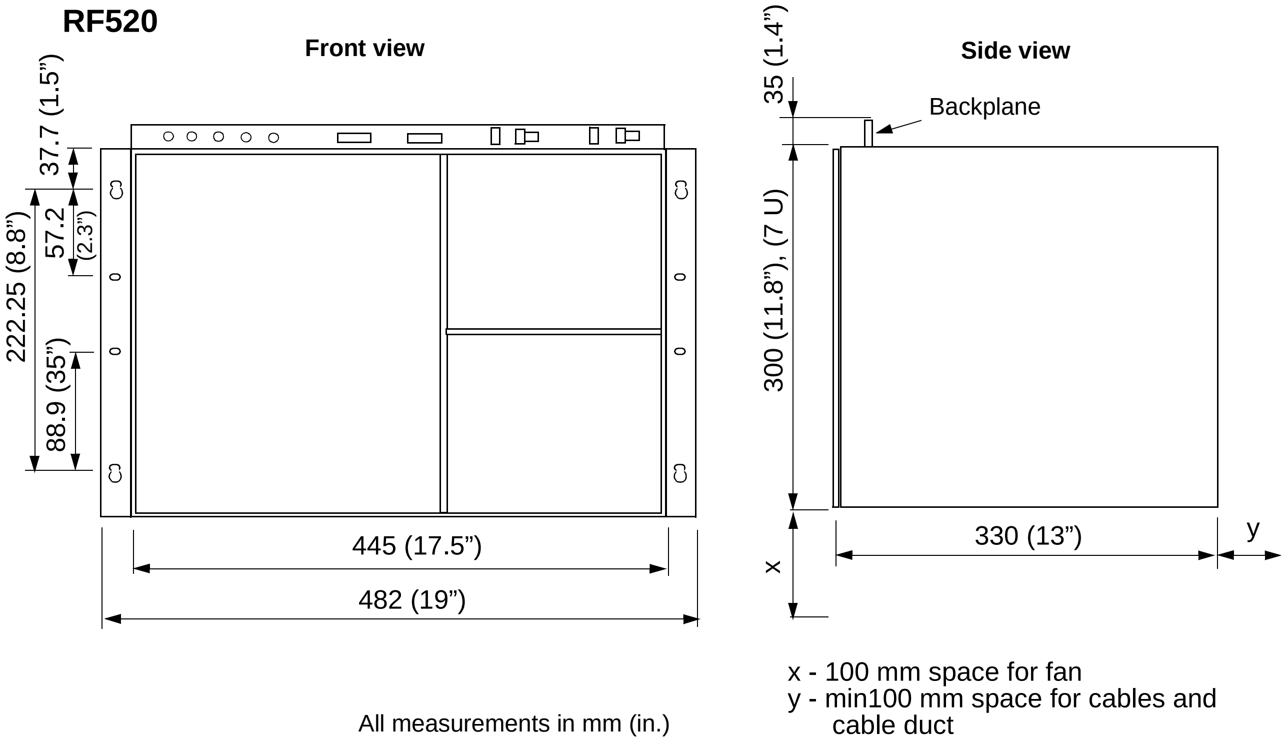
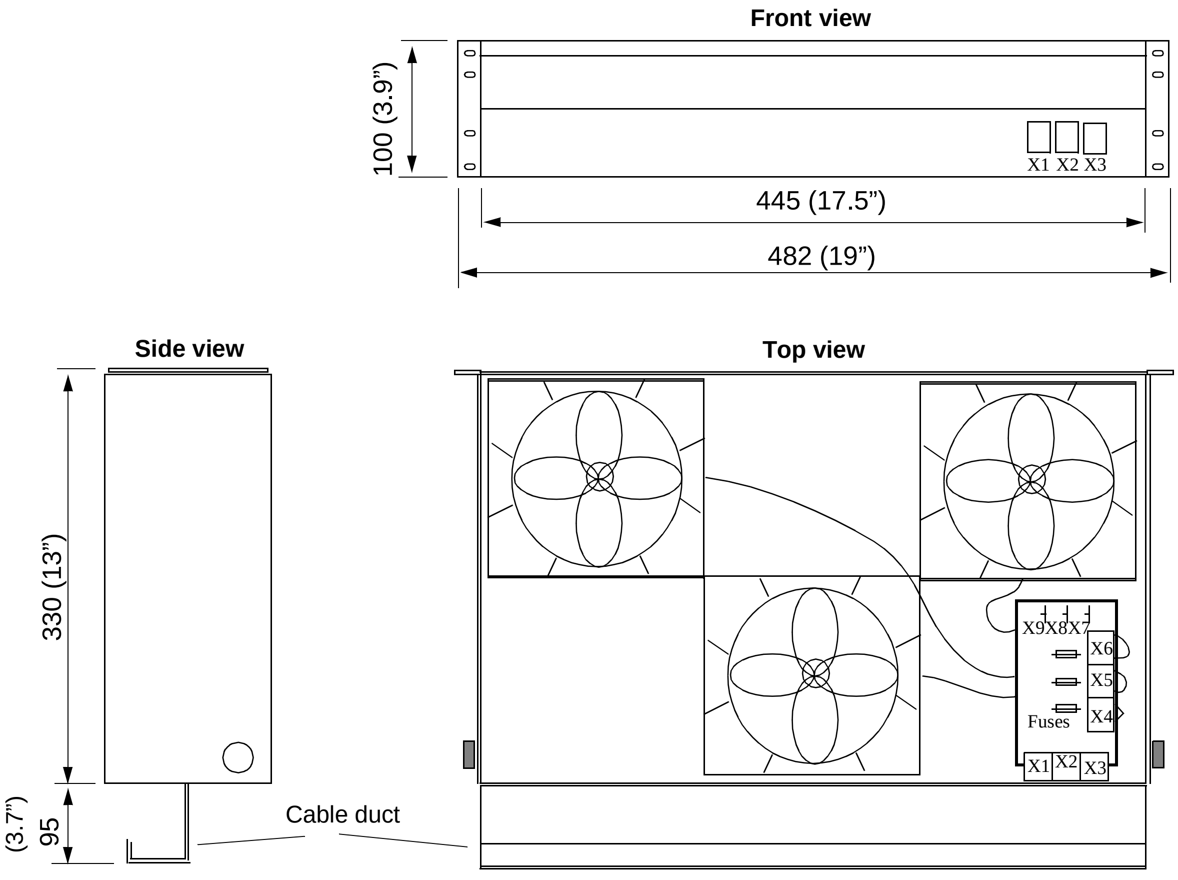


Figure C-1. Subrack RF520

C.2 Fan Unit RC510



All measurements in mm (in.)

Figure C-2. Fan Unit RC510

C.3 Subrack for Modems RF540 and RF541

Two modem subracks exist.

RF540 is designed for 12 modems and is 24” wide (suits the RE500 cabinet).

RF541 is designed for 9 modems and is 19” wide (shown in the figure below).

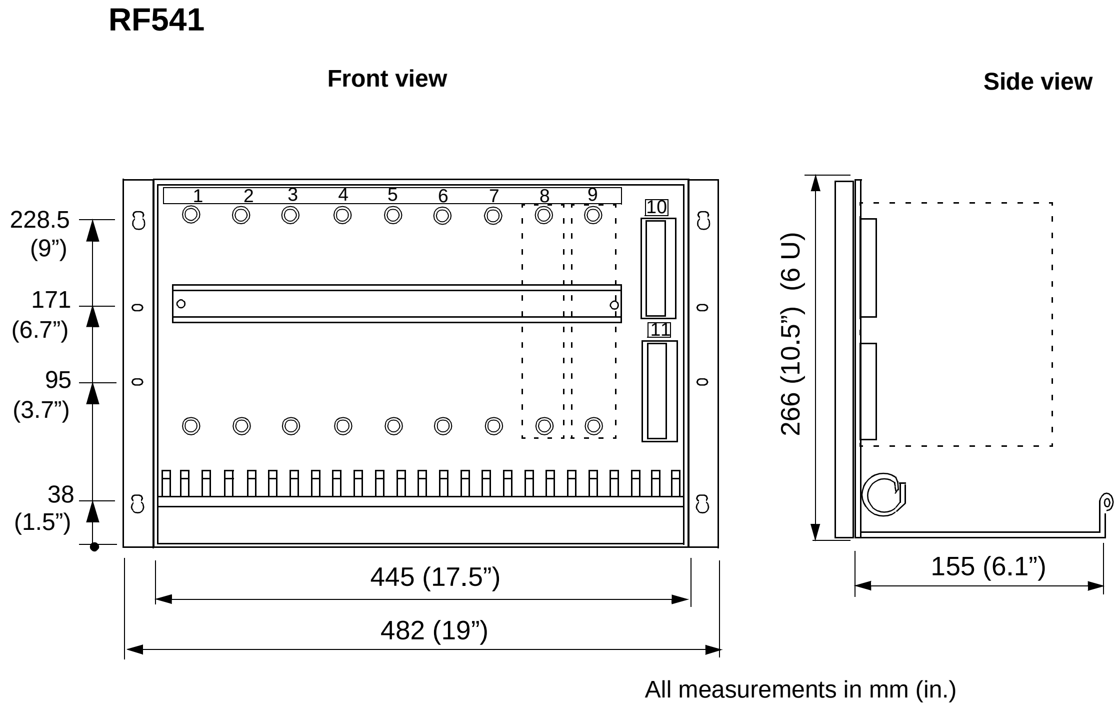
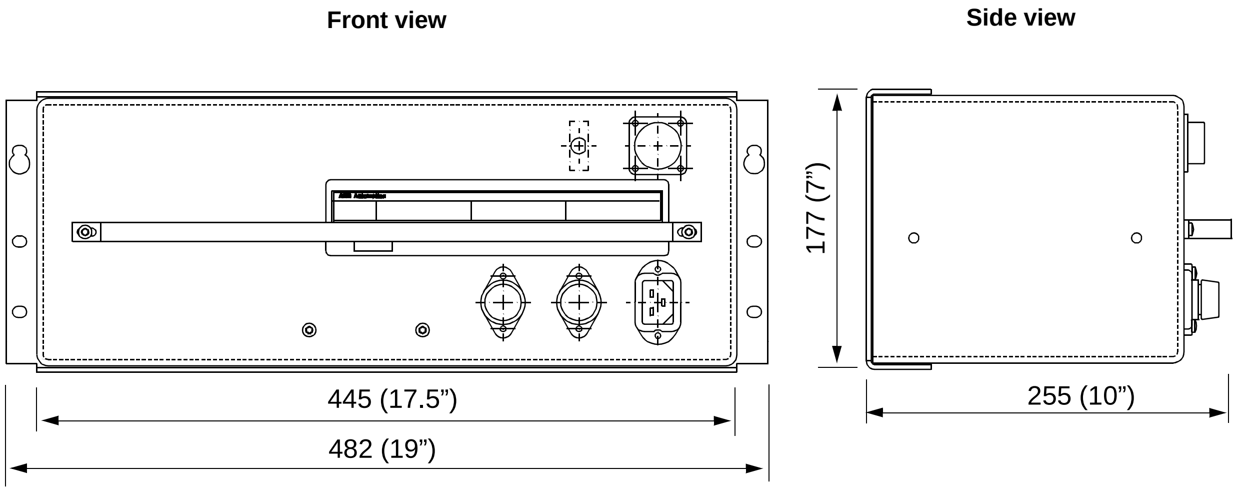


Figure C-3. Modem Subrack RF541 (19”)

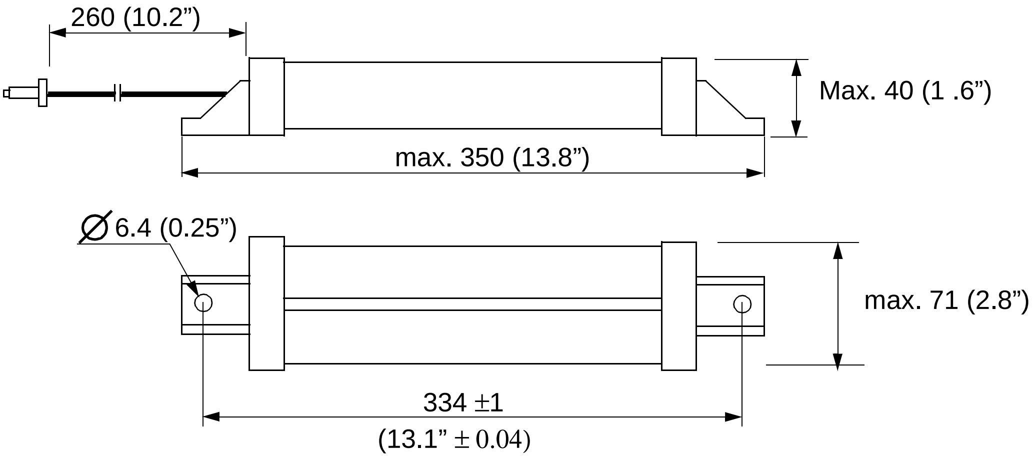
C.4 Power Supplies SA16x



All measurements in mm (in.)

Figure C-4. Power Supply SA161, SA162, SA167 or SA168

C.5 Battery Package SB520



All measurements in mm (in.)

Figure C-5. Battery Package SB520

C.6 Cabinet Type RE500

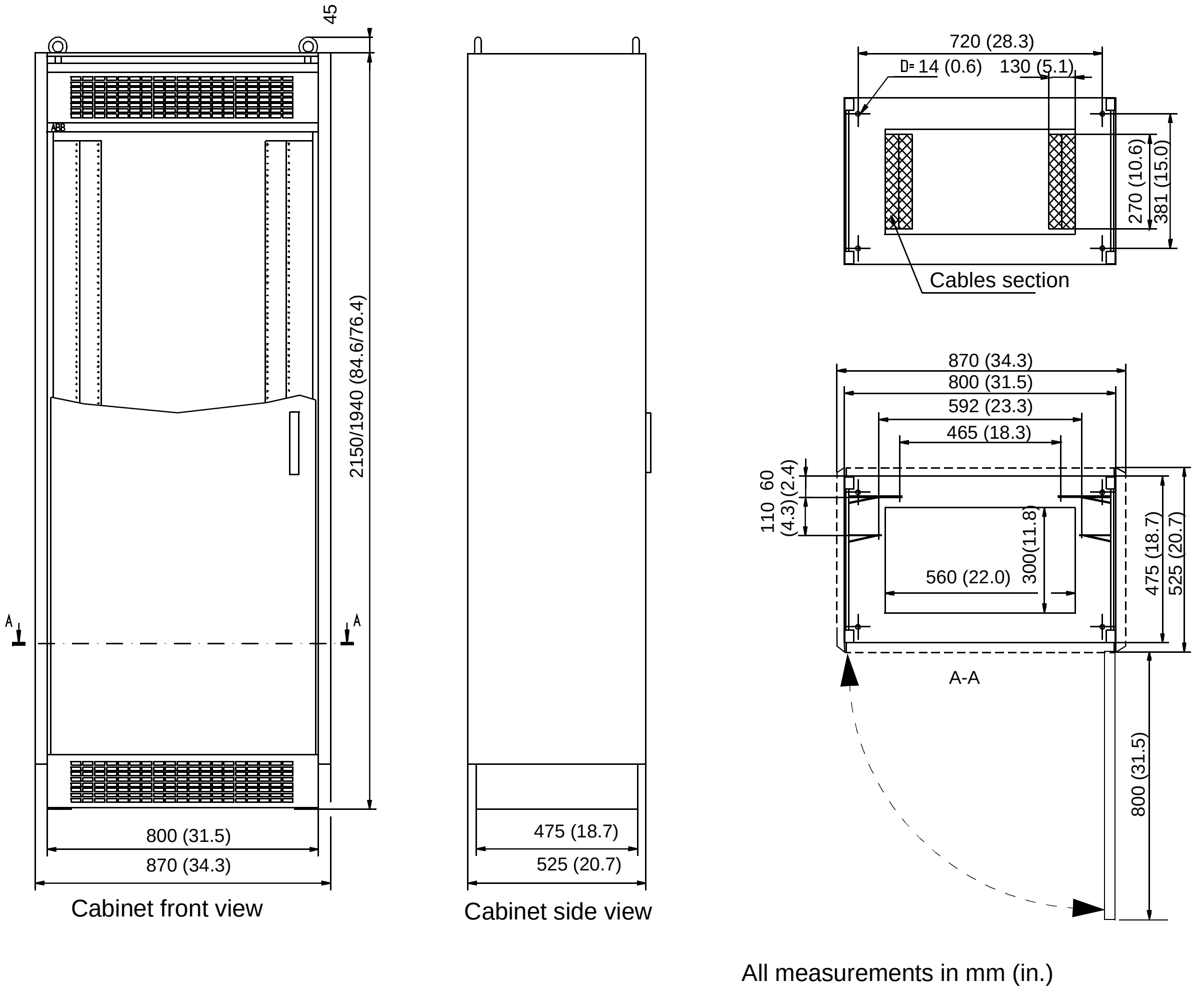


Figure C-6. Cabinet RE51x

C.7 Optical Bus Extension

Please refer to Appendix D Optical Bus Extension for S100 I/O.

Appendix D Optical Bus Extension for S100 I/O

D.1 General Description

The optical bus extension is a complement to the normal S100 I/O bus extension used in the product Advant Controller 450.

With the optical bus extension I/O subracks can be placed up to 500 meters from the central subrack of the controllers/process stations.

The optical bus extension is a serial link designed for point-to-point connection (multidrop configuration is not possible) of up to 5 I/O subracks in the far-side. Between the I/O subracks in the far side, the normal bus extension is used.

The optical bus extension consists of two modems, TC560 in the near-side and TC561 in the far-side. Between the modems there is a serial link containing two optical fibres, one for sending and one for receiving signals. Link redundancy is not possible.

In the near-side up to 5 “nodes”, I/O subracks with DSBC 173A or TC560, can be connected with the normal bus extension.

All supervision signals connected to the DSBC 173A in the far-side are transferred via the optical bus extension to CI540 in the central subrack.

The modems can be powered by two independent 24V d.c. supplies internally connected to each other via diodes.

Two additional Supervision Signals (FA, FB) are generated internally from two 24 V Digital Inputs on the far-side, and transferred to two 24V Digital Outputs on the near-side. In this way, a supervision of the power supply voltages on the far-side can be carried out on the near-side.

D.2 Bus Extension Configuration for S100 I/O Subracks

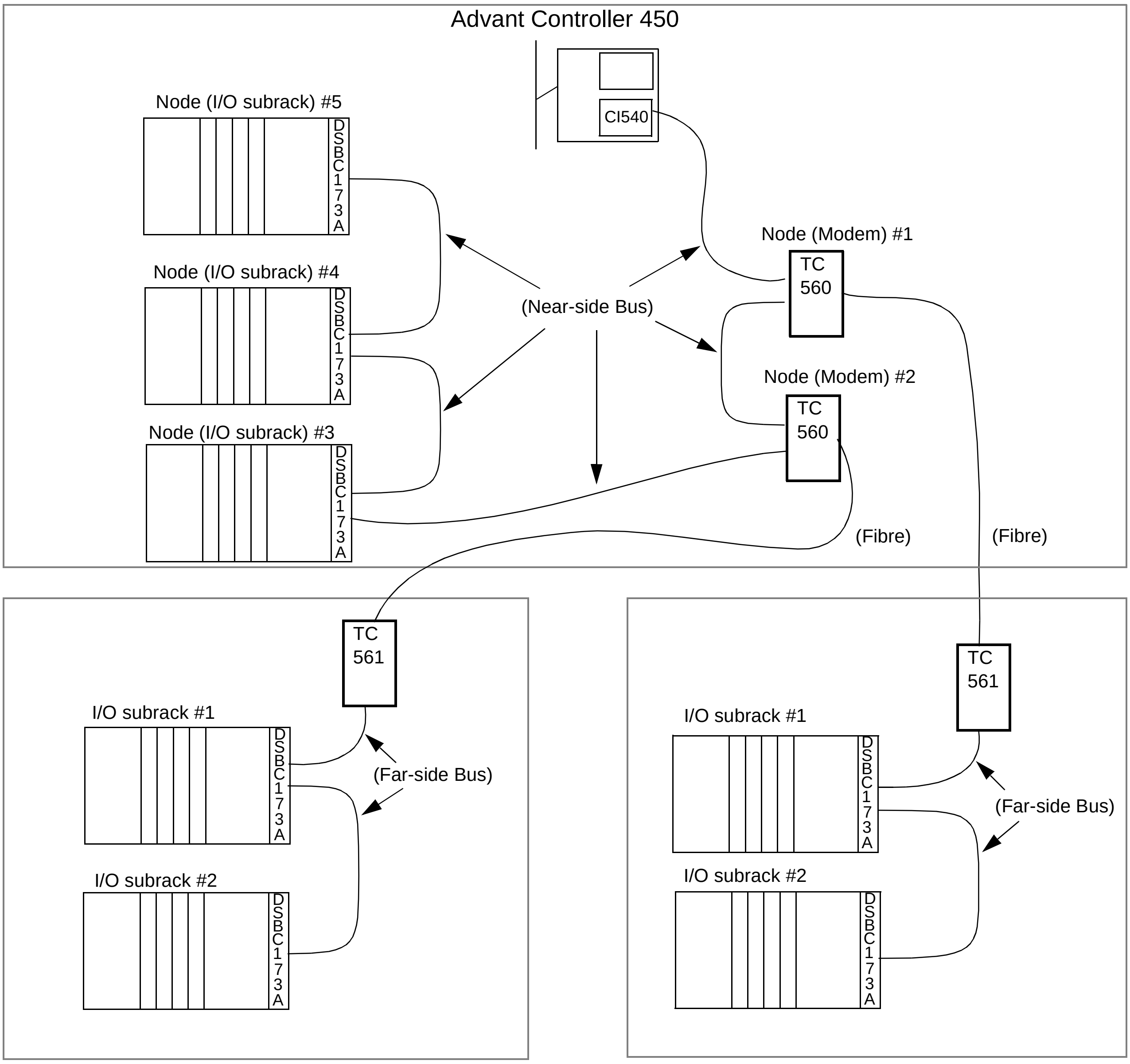


Figure D-1. Example of Optical Bus Extension with Advant Controller 450

Advant Controller 450 - I/O Subracks chained together with Bus Extension Cables **and** Optical Bus Extensions.

D.2.1 Components

The following components are tied to the optical bus extension:

TC560	Modem	(Near-side)	3BSE004730R0001
TC561	Modem	(Far-side)	3BSE005275R0001
TK560	Interconnector	(Near-side)	3BSE005880R0001
TX560	Terminator	(Near-side)	3BSE005881R0001
TK580	Cable Assembly	(Near-side; 1.8m)	3BSC950057R0001
TK580V007	Cable Assembly	(Near-side; 0.7m)	3BSC950057R0002
TK575	Cable Assembly	(Near-side; Far-side; 3.5m)	3BSC950054R0001

D.2.2 Boundary Conditions

Boundary Conditions (See Figure D-2 and Figure D-3)

Near-side Bus:

- Max total bus cable length: 12 m.
- Max No. of “nodes”: 5 (“node”: DSBC 173A or TC560)
- TK560 as well as TX560 shall be mounted on front of TC560. (See also Figure D-7). Due to this, the clearance distance from the front to TC560 shall be not less than 90 mm.
- In case of maintenance, TK560 as well as TX560 may be removed from TC560.
- It is recommended that any DSBC 173A on the near-side shall be connected *after* the TC560s on the bus (see Figure D-3).
- The above recommendation implies that if any DSBC 173A is connected on the near-side, the Terminator DSTC 176 applies instead of TX560. See also *S100 I/O Hardware Reference Manual* (e.g. 3BSE002413R0001, Section 2-1, Figure 2-1).
- The connection between CI540 and TK560 (or TX560) takes place by means of TK580.
- The connection between TK560 and DSBC 173A takes place by means of TK575.

Serial Link:

– Medium:	Optical Fibre (dual)
– Type:	62,5/125 µm (50/125 µm also possible)
– Connection:	Bayonet ST Connector Receptacle (on TC560/TC561)
– Max. length:	500 m

Far-side Bus:

- Max total bus cable length: 12 m.
- Max No. of “nodes”: 5 (“node”: DSBC 173A *only*).
  Restriction: On the far-side, the Selective/Global INHIB function on DSBC 173A must be completely disconnected (see also *S100 I/O Hardware Reference Manual*, e.g. 3BSE002413R0001, Section 2.3.1, Table 2-2). This can be done by either removing the two S2 jumpers on DSBC 173A completely, or moving them from the two lower positions (6,3 or 4,1) to the two upper positions 12,9 or 10,7).
- The connection between TC561 and DSBC 173A takes place by means of TK575.

D.2.3 Supply Voltage Status Transfer

Supervision of the power supply voltages on the far-side (24 V A and 24 V B) is done by connecting 24 V A and 24 V B through a Diode Unit (either DSSS 170 or DSSS 171) to the inputs FA and FB of TC561, and the outputs FA and FB of TC560 on the near-side to TC520. If more than one optical bus extension are connected to the same CI540, the outputs from the TC560s may be connected in parallel in a wired-or configuration (see also Figure D-4 and Figure D-6).

Power Status (See Figure D-4).

Near-side Outputs:

- 24V Digital outputs, 2 channels (non-isolated) FA and FB
- Short-circuit proof; min. load 2,2 kohm (corresponding to max. 10 mA).
- Connection: 3-pin detachable terminals (cable area = 0.5 - 2,0 mm^2)

Note 1: *Each Near-side output is controlled by a corresponding Far-side input.*

Note 2: *Near-side outputs may be chained together in a “wired-or” configuration.*

Far-side Inputs:

- 24V Digital inputs, 2 channels (non-isolated) FA and FB
- Input switching level: 13.0 V +/- 1.0V
- Connection: 3-pin detachable terminals (cable area = 0.5 - 2,0 mm^2).

When employing either the Diode Unit DSSS 170 or the Voting Unit DSSS 171, (see also Section D.2.4 Powering the Modems), the corresponding Status Connections are:

Table D-1. Status Connections

STATUS	TC560/TC561	DSSS 170	DSSS 171/DSBB 188
Sup. 24VA	X1+X2: 1 (FA)	X3: 14 (24VFAILA)	X6+X7: 1 (FAIL24V_A)
Sup. 0VA	X1+X2: 3 (0V)	X3: 5	X1: b (0V_A)
Sup. 24VB	X1+X2: 2 (FB)	X3: 16 (24VFAILB)	X6+X7: 2 (FAIL24V_B)
Sup. 0VB	X1+X2: 3 (0V)	X3: 6	X2: b (0V_B)

D.2.4 Powering the Modems

Power requirements of TC560 or TC561 (See Figure D-5)

- Supply: +24 V d.c.
- Voltage range: 18 - 30 V.
- Can be connected to two independent power sources (internally united by means of diodes).
- Power consumption, near-side: 5.6W (Digital output channels: NOT included)
- Power consumption, far-side: 6.6W (Digital input channels: negligible)
- Connection: 2-pin detachable terminals (cable area = 0.5 - 2,0 mm^2).

NOTE

For supervision reasons, the +24V Supply on the near-side shall correspond to that of the Central Subrack, and the +24V Supply on the far-side shall correspond to that of the I/O Subrack(s). This implies that when employing either the Diode Unit DSSS 170 or Voting Unit DSSS 171, the corresponding Power Connections are:

Table D-2. Power Connections

POWER	TC560/TC561	DSSS 170	DSSS 171/DSBB 188
24VA	X1: 5 (24V)	X3: 1	X1: a (24V_A)
0VA	X1: 6 (0V)	X3: 5	X1: b (0V_A)
24VB	X2: 5 (24V)	X3: 3	X2: a (24V_B)
0VB	X2: 6 (0V)	X3: 6	X2: b (0V_B)

D.2.5 LED Indications

LED Indications on TC560 or TC561(See Figure D-6)

- RF = Remote Failure (Red)[1) 2)]
- P = +5 V_OK (Green)
- INH = INHIBIT (Yellow) 2)
- INIT = INIT (Yellow) 2)
- TX = Transmission (Yellow)
- RX = Reception (Yellow).

Note: *The same LED Indications are found on Near-side (TC560) as well as Far-side (TC561).*

---

1. This is a sum error indication for all five Remote Status Signals (REGMISS, REGFAIL, FANFAIL, FA, FB),
2. See also *S100 I/O Hardware Reference Manual* (e.g. 3BSE002413R0001 Section 2-2, Figure 2-3).

D.2.6 Use and Maintenance Guidelines

In case of maintenance, such as replacement of a unit (TC560 or TC561) or replacement of Optical Fibre, ***it is recommended to disconnect the power of the relevant unit before carrying out any such maintenance.***

This implies that if TK560 or TX560 is to be disconnected from (or connected to) TC560, this should be done only after the power of TC560 has been disconnected.

If maintenance of a far-end unit (TC561) takes place, this may be done without disconnecting the power of the near-end unit (TC560), and vice versa.

If the power of a TC560 is to be disconnected, then the Status-signals (FA, FB) of that unit must also be disconnected, since the two 24 V Digital Outputs only work properly with a 24 V Supply connected.

CAUTION

Never disconnect an Optical Fibre of a unit under running condition, since this may cause disturbances on the on-going data traffic between the CPU and the I/O devices.

CAUTION

When using Cable Assembly TK575, always make sure that Cable Lug M3 has a good ground connection to the relevant subrack.

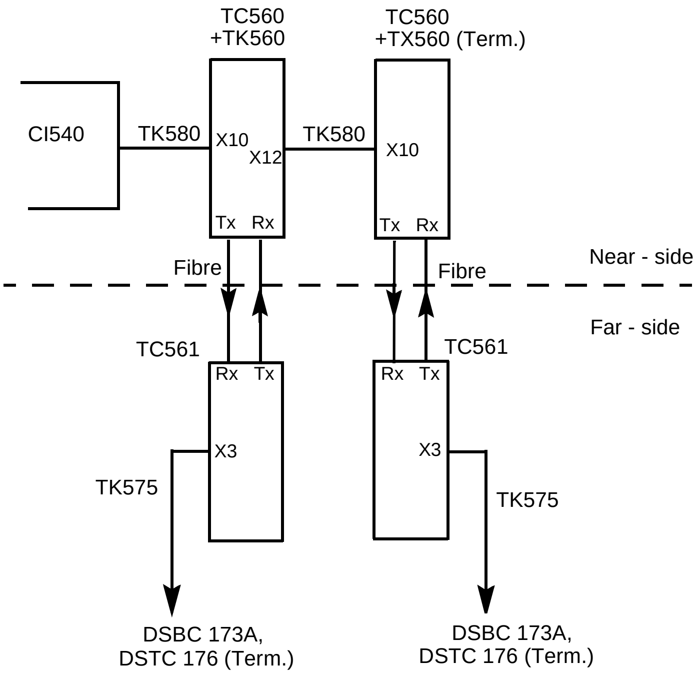


Figure D-2. AC 450 with TC560 on Near-side

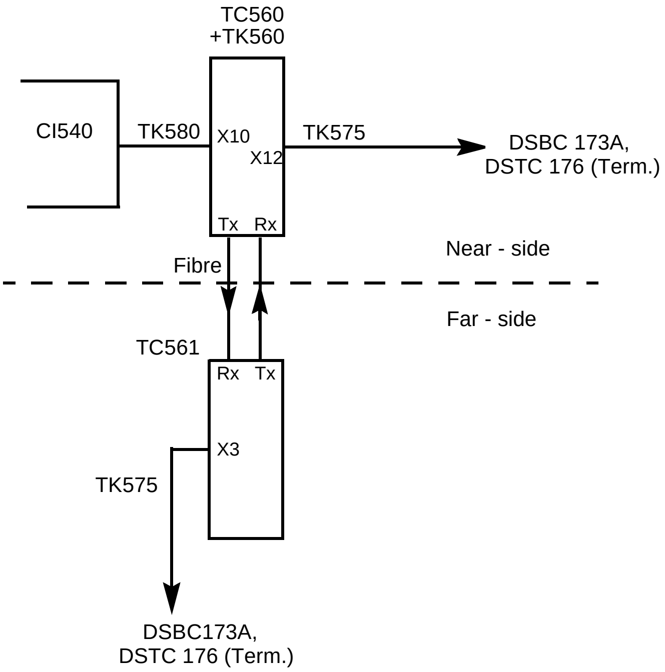


Figure D-3. AC 450 with both TC560 and I/O Subracks on Near-side

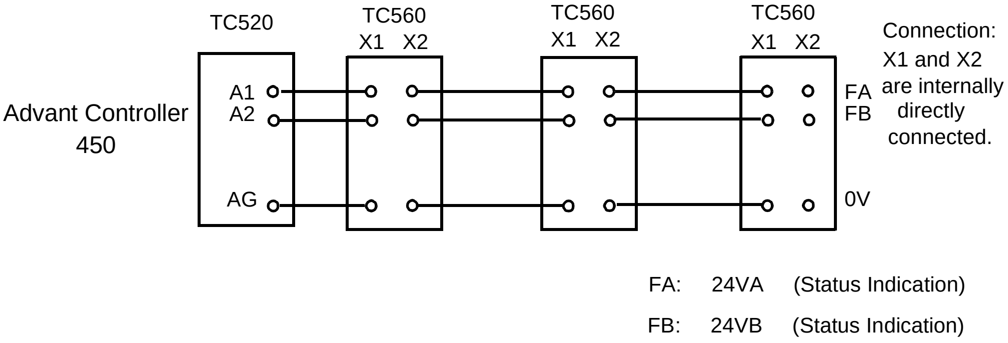


Figure D-4. Connection of Supervision Signals from TC560

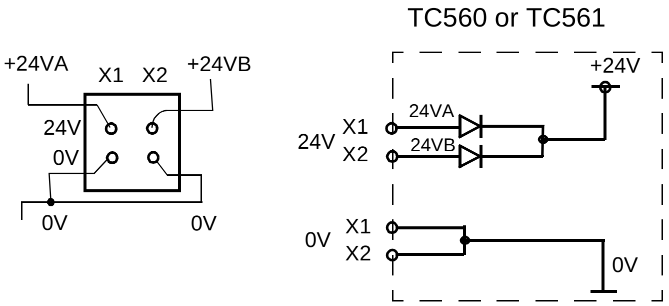


Figure D-5. Connection of Supply Voltage to the Modems

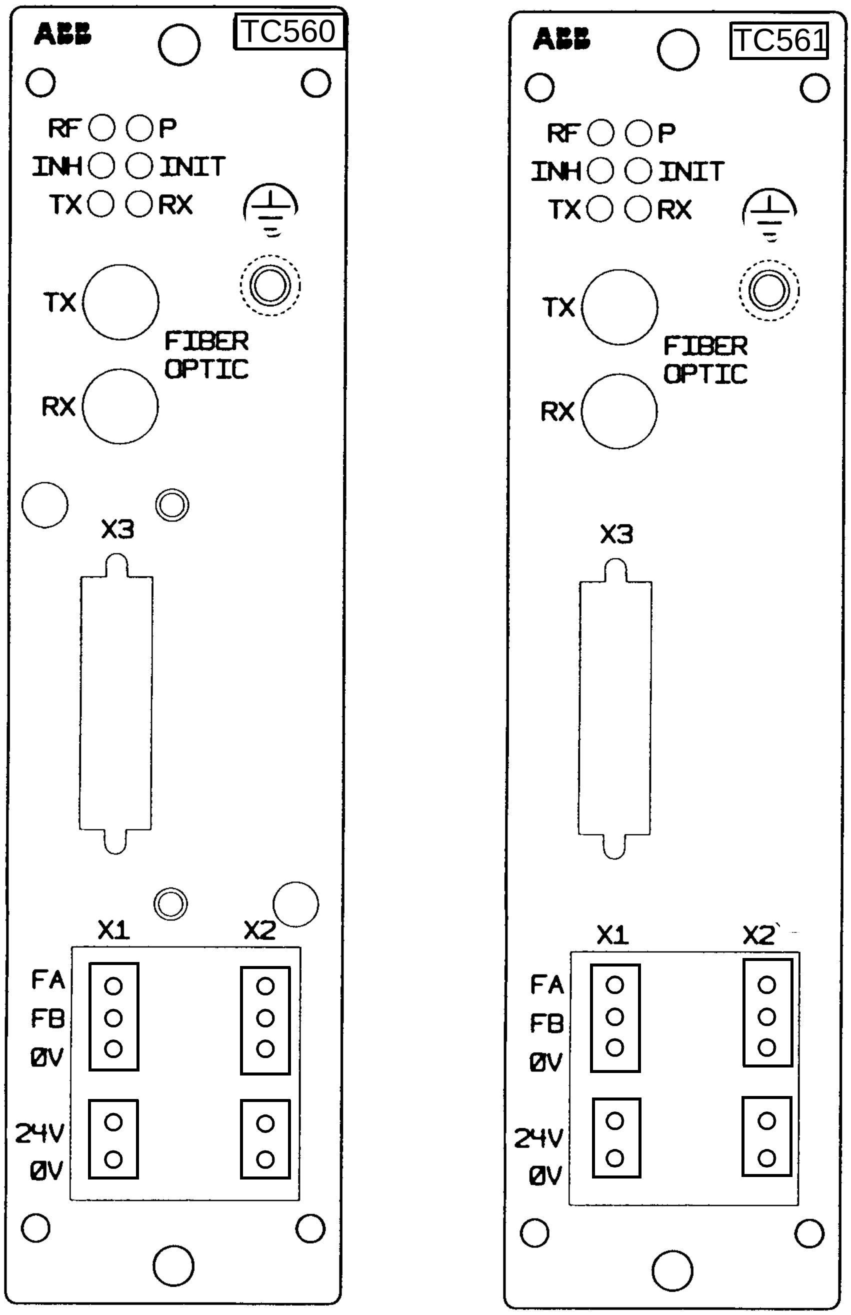
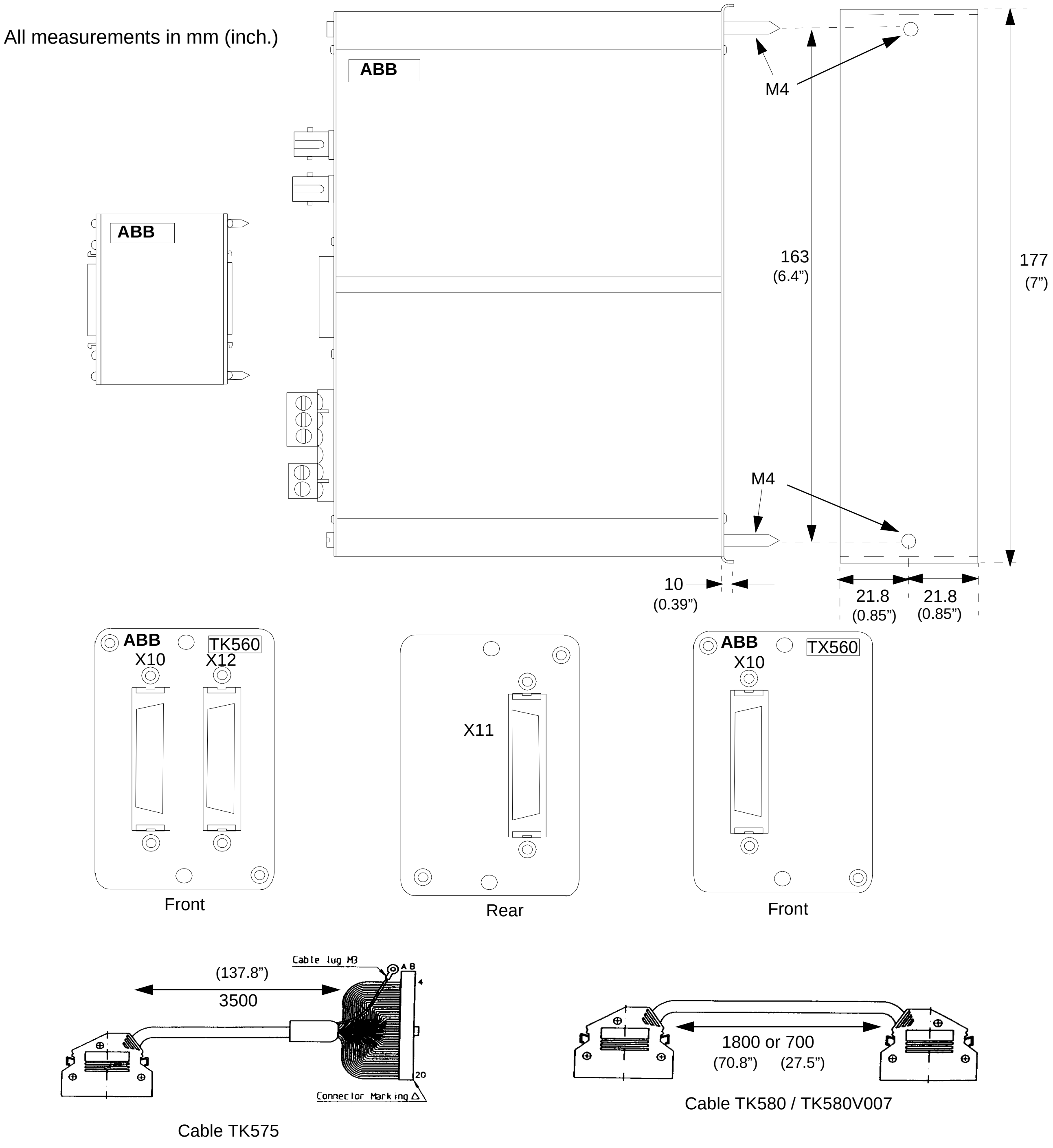


Figure D-6. Front Plates of TC560 and TC561



Front

Rear

Front

Cable TK575

Cable TK580 / TK580V007

Figure D-7. Mechanics

Appendix E Ordering Information

E.1 CPU Subrack (AC) in a New Cabinet

Use the normal price lists for the Advant Controller 450 and order a controller consisting of cabinet, CPU subrack (AC), necessary carrier and communication boards, power supply etc.

If some extra parts, not found in the Advant Controller 450 price list, are needed, then the spare parts price list can be useful.

E.2 CPU Subrack (AC) in an Existing Cabinet

Order the CPU subrack (AC) as a basic unit from the normal price list for the Advant Controller 450. Order also all other necessary parts from the normal price list or from the spare parts price list.

E.3 Ordering Numbers for Special Parts

Ordering numbers for some parts are not found in the normal price list for the Advant Controller 450 or in the spare parts price list.

Table E-1. Ordering Numbers for Special Parts

Part	Ordering Number	Remark
DSBC 173A	3BSE005883R0001	DSBC 173 must not be used
DSTK 183	2639 0603-BX	
TK577	3BSE004650R0001	
Details for optical bus extension		Refer to Appendix D

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February 1996